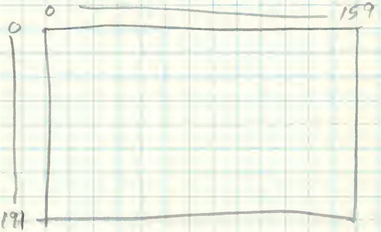
LEAFER MADNESS

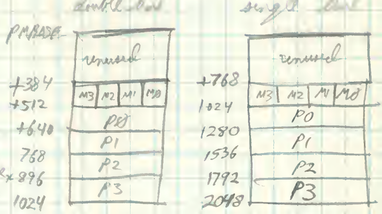
Screen mode E

4 colors
40 bytes/line
160 pixels/line
1 scan line per row
7680 bytes/screen

0,0 for P/M is 47,32



For player/missile graphics



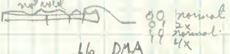
① Set PMBASE (D407)

② Store images in P/M RAM

③ Set Color COLPMx, shadow PCOLRx

④ " HPOSPx

⑤ " SIZEPx



⑥ Set vertical resolution + enable DMA in DMACTL (D400) shadow SDMCTL (22F)

⑦ Set GRACTL (D01D)

⑧ PRIOR (GPRIOR)
D01B 26F

To align PM to upper-left corner (single line res.)

HPOS = $2F = 47

VPOS = $20 = 32 (# bytes from PM boundary)

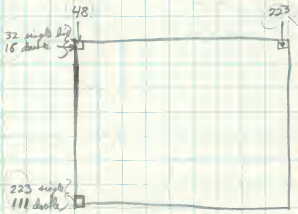
TV screen aspect ratio is

PM upper left corner is at HPOS = 30

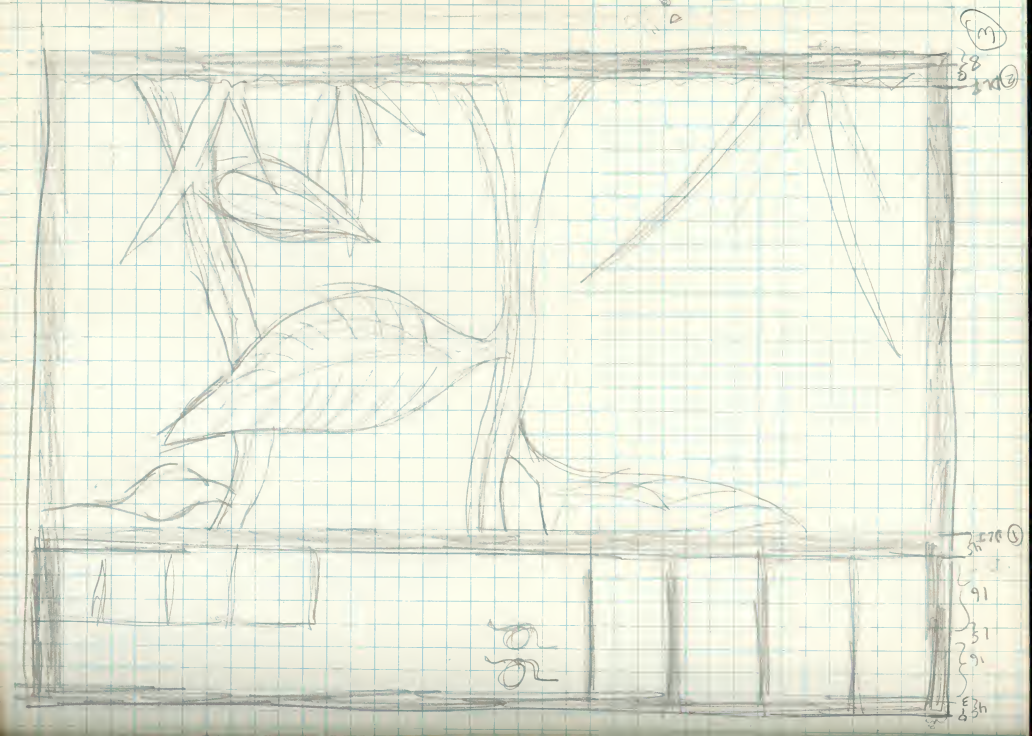
(byte # in PM memory) → VPOS = 20 (single line res.)

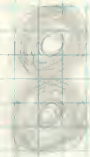
" VPOS = 10 (double line res.)

Player/Missile viewable range (normal playfield) (numbers are decimal)

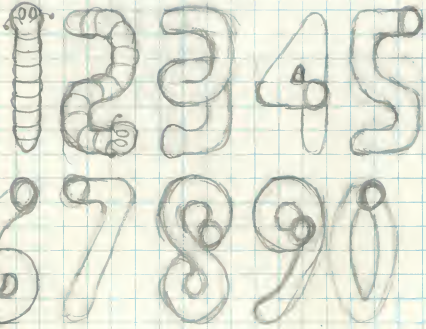


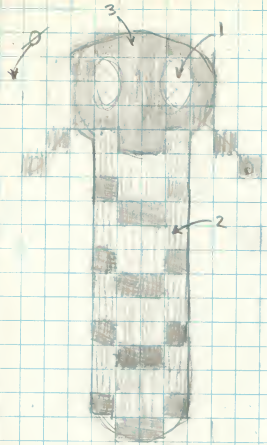
with this value only leftmost pixel in byte will show.

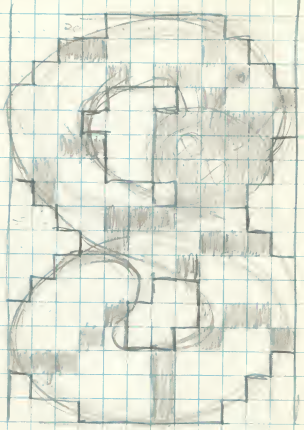


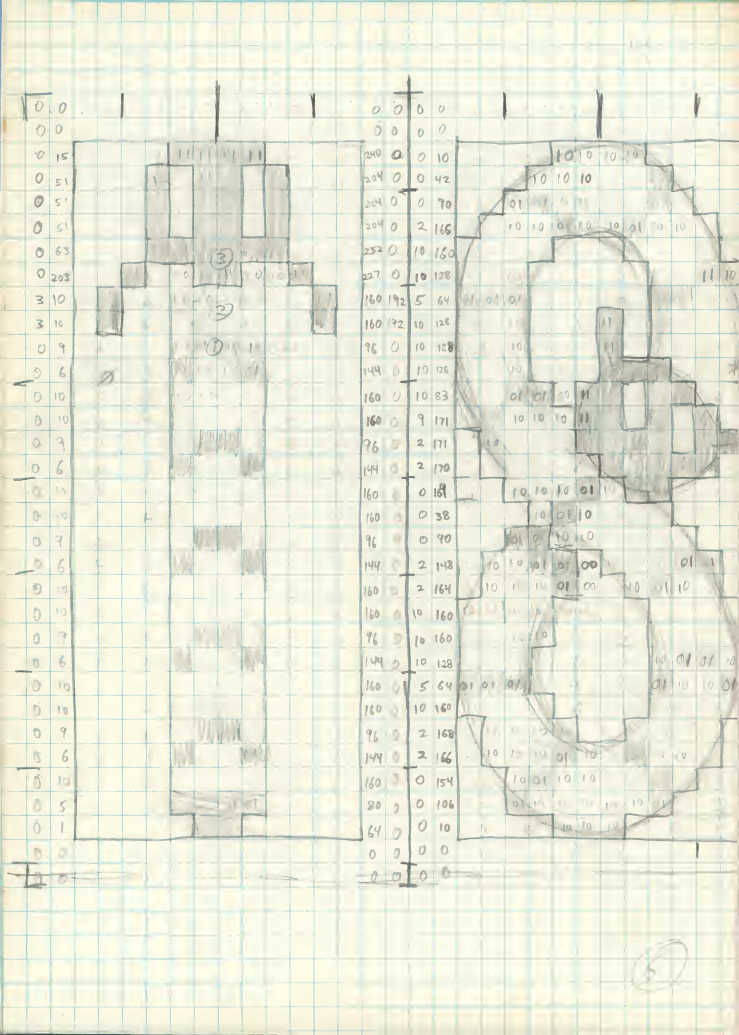


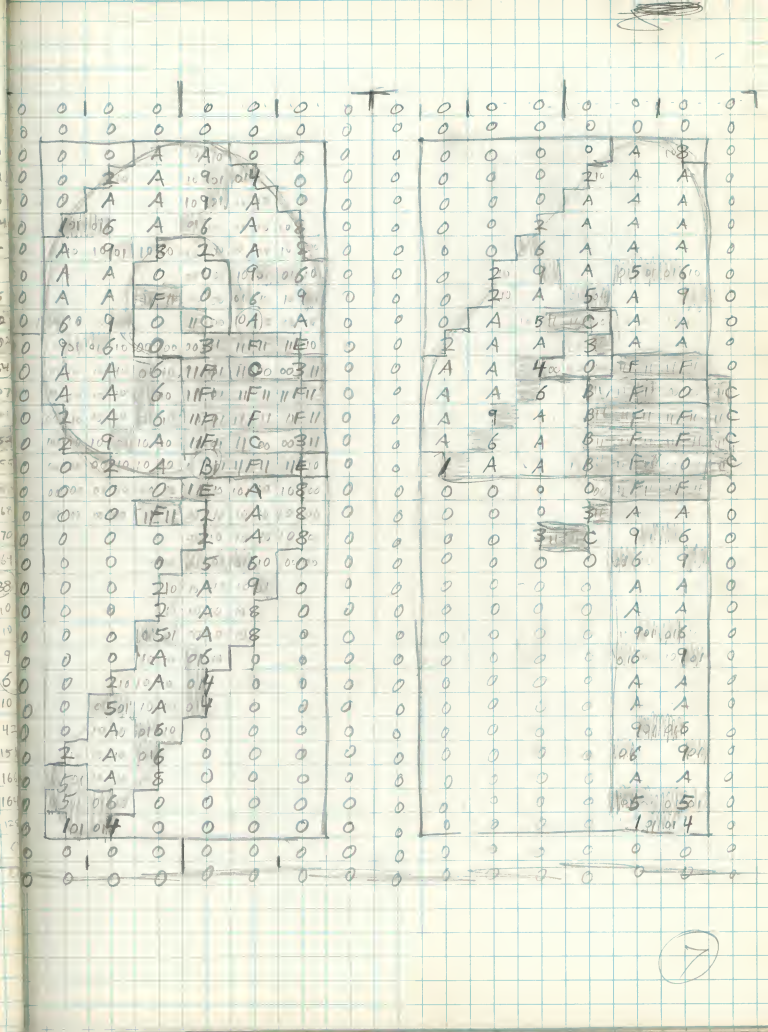
0 C2. Dk. grn
1 #8A lt. blue
2 #1C yellow
3 0 black

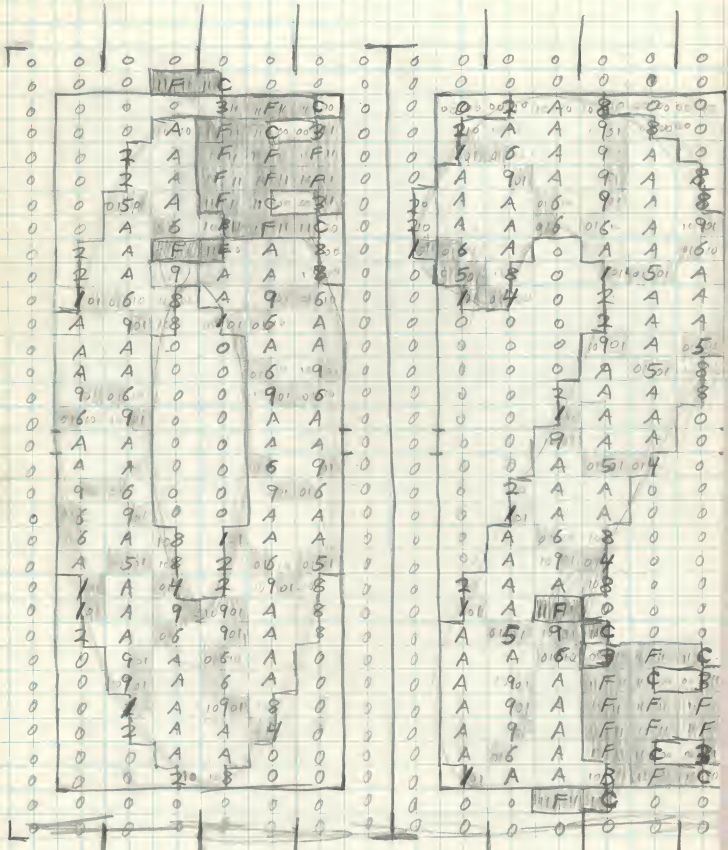


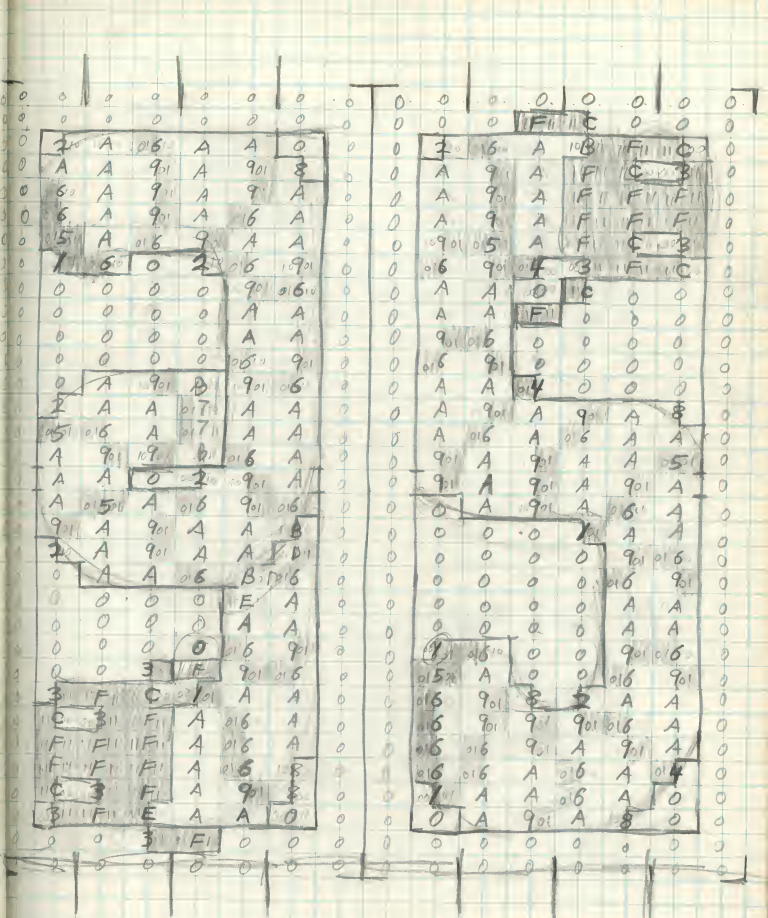

3
1
2

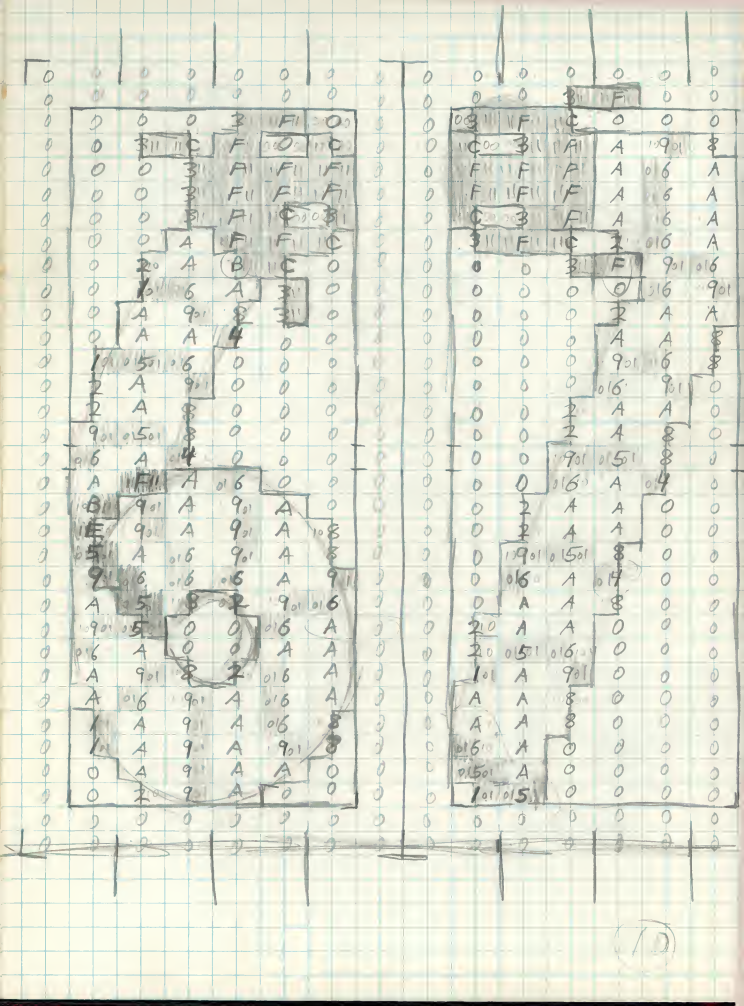










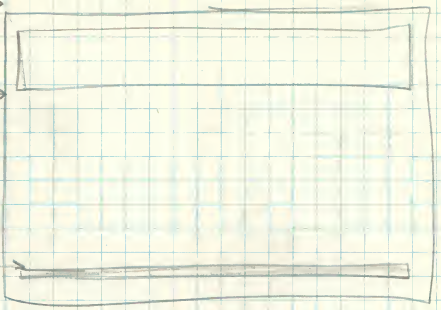


OS reg   pixel (hex)   (occurs after scan line #

	2C8	0	70
VBI	2C4	1	2E
sets	2C5	2	18
	2C6	3	12
		0	0
DLI 1		1	C4
		2	CA
		3	42
		0	12
		1	C4
DLI 2		2	08
		3	FE

40

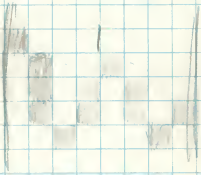
184



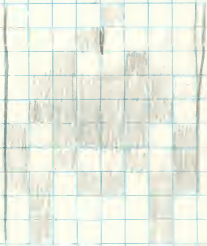
```
DLIST  -> 70
          70
          70
          4E
          SMEM&255
          SMEM/256
DLIST +6 -> E
          E
          E
          .
   +100 -> E
   +101 -> 4E
          [SMEM+$1000]&255
          [SMEM+$1000]/256
    104   E
          .
          E
    199   41
    200   DLIST&255
    201   DLIST/256
```

DLI1 occurs @ DLIST + 45
DLI2 occurs @ DLIST + 190

$05
6
F
9



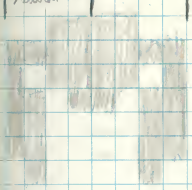
$80
$48
$54
$55
$22



$24
$7E
$7E
$BD
$A5
$DB
$42
$42

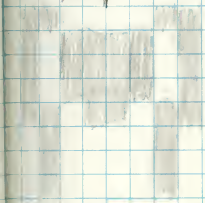
$10

neutral



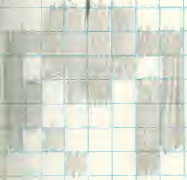
$3C
$FF
$BD
$DB
$C3
$C3
$42

rear legs raised



$C3
$BD
$BD
$BD
DB
42
42
42

right leg twitches



3C
FF
BD
DB
C3
A3
12

left leg twitches

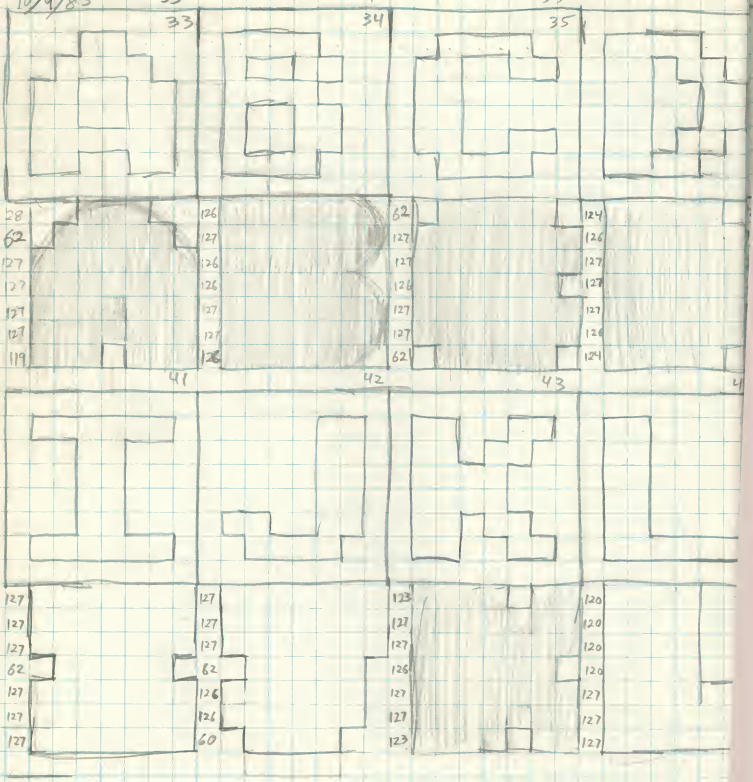
3A
FF
BD
DB
C3
C5
48

left legs

3C
FF
BD
DB
C3
A5
18

NB

10/9/83 Original



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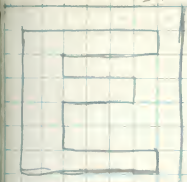

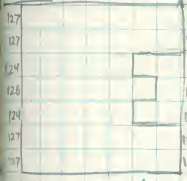

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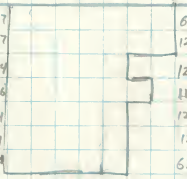

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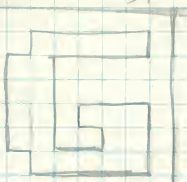

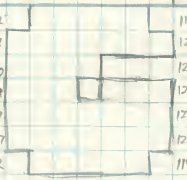

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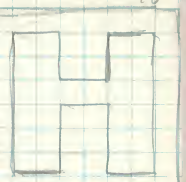

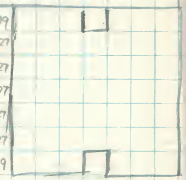

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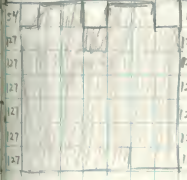

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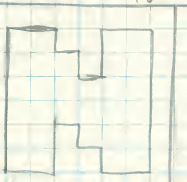

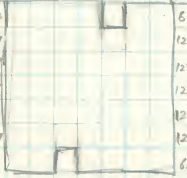

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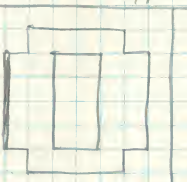

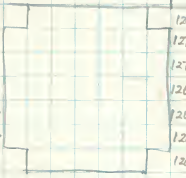

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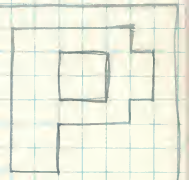

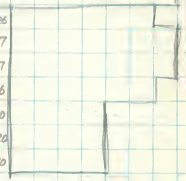

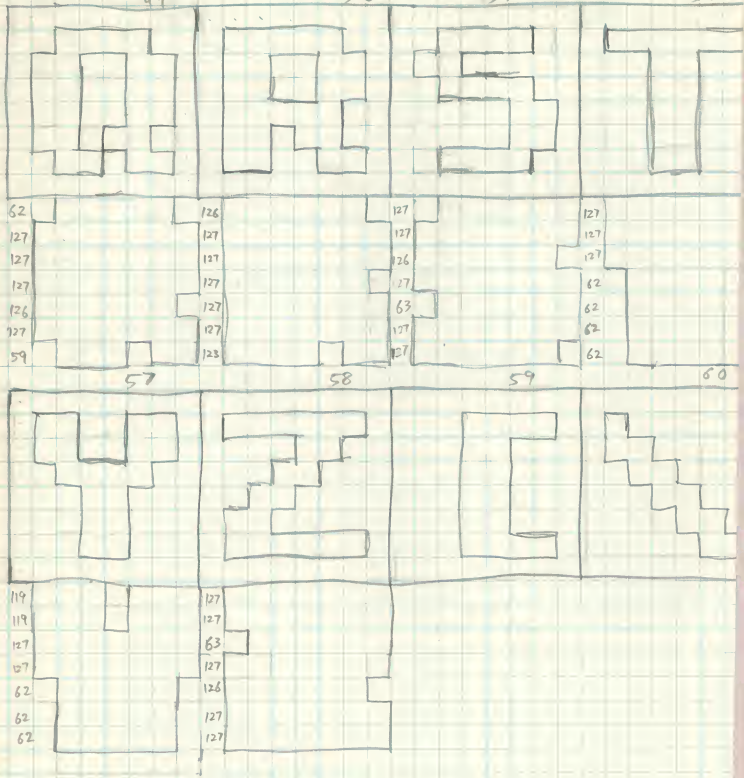
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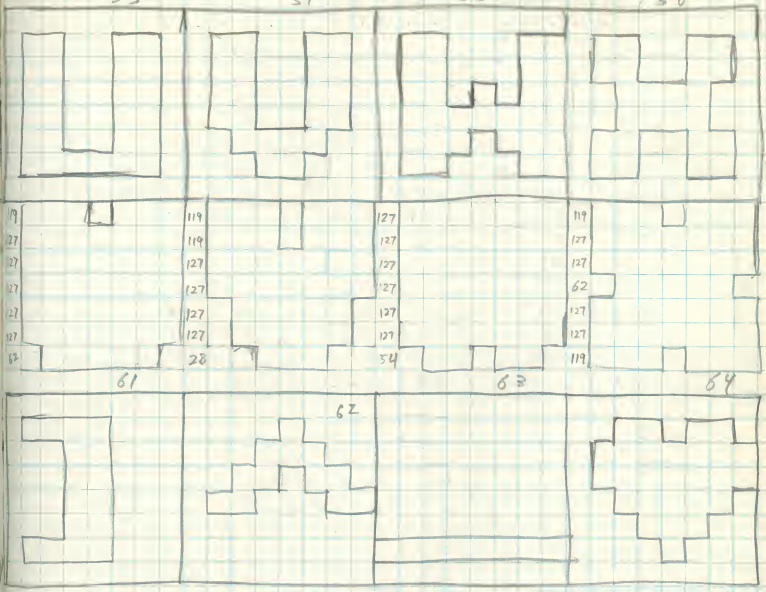
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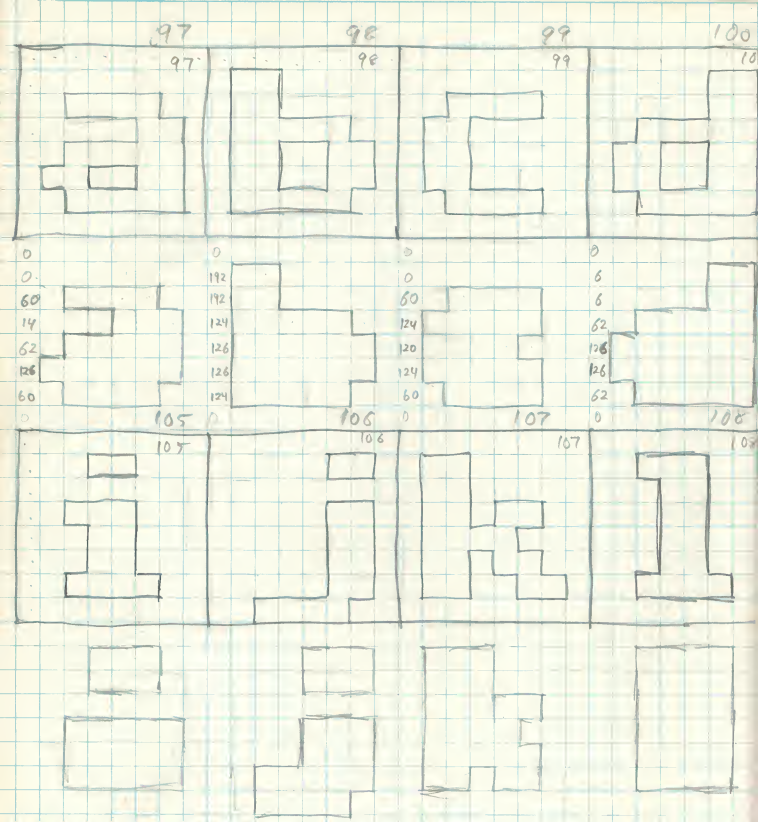
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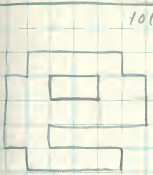

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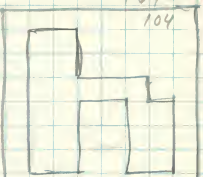

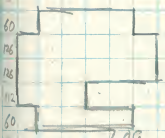

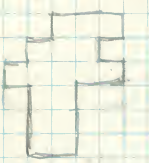

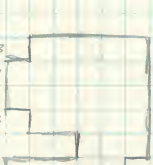

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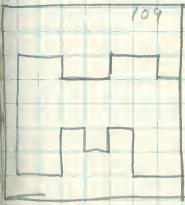

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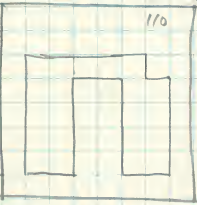

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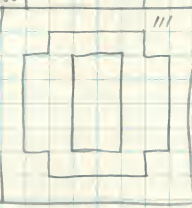

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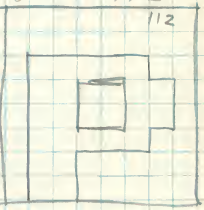

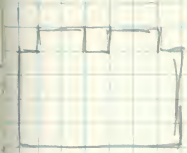

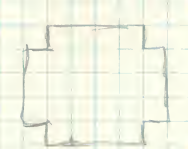

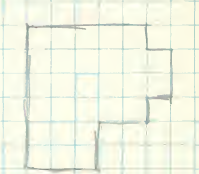

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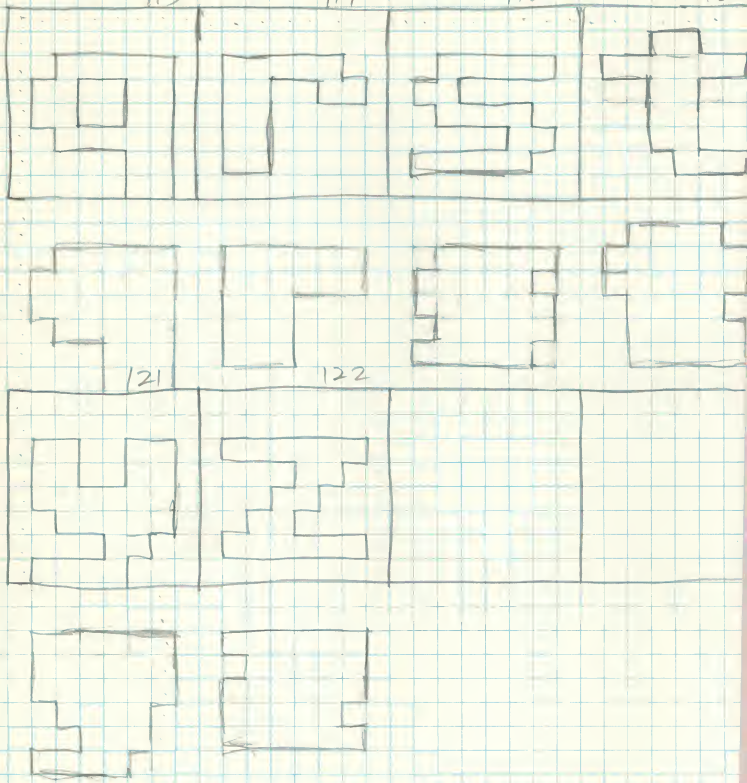
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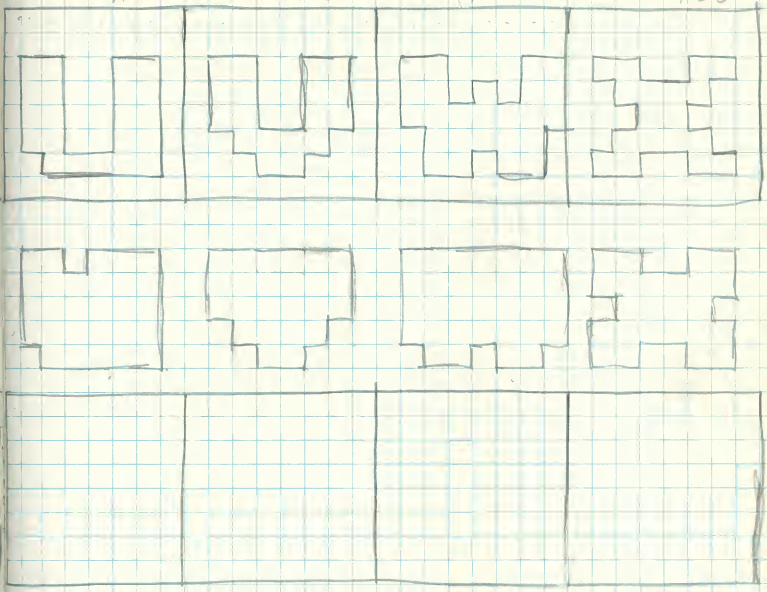

BLANK

22

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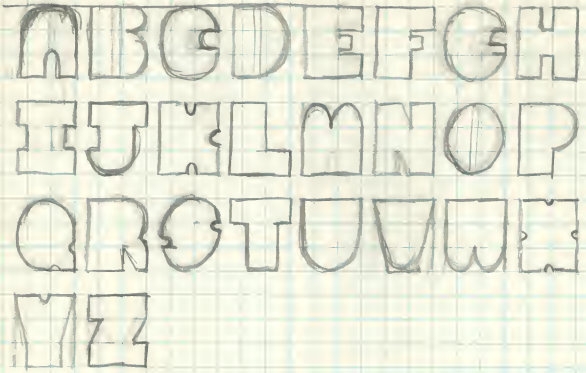
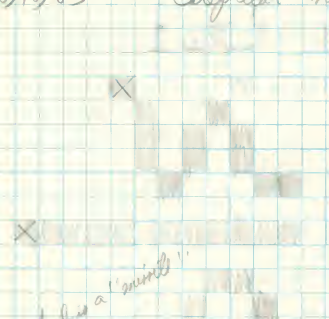
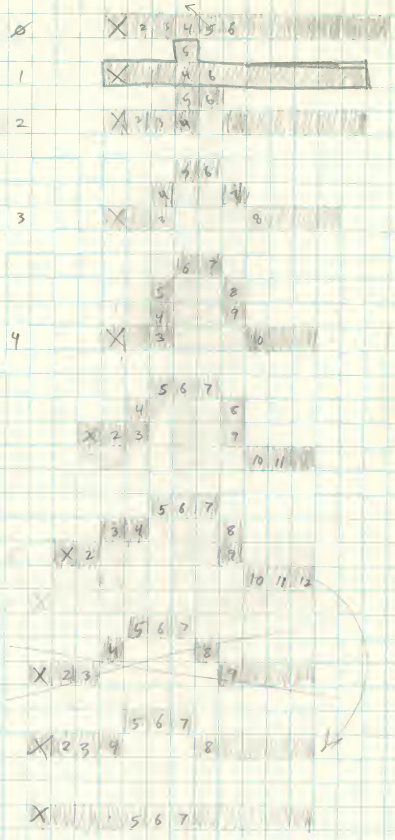


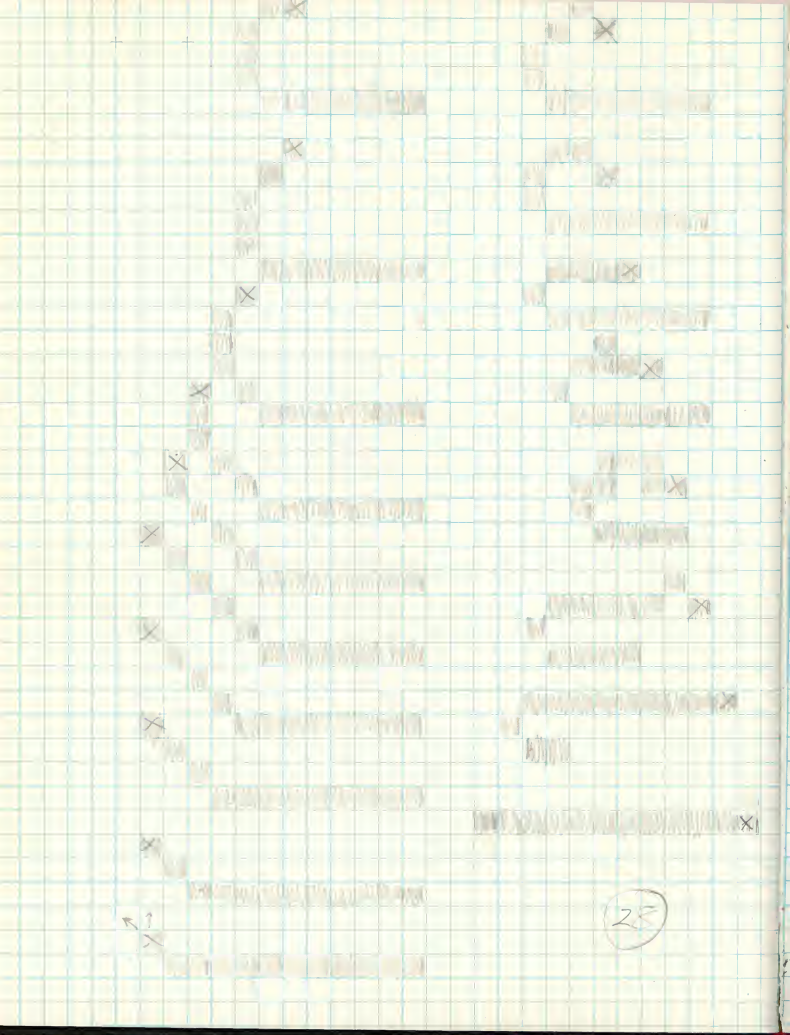

ABCDEFGH

10/10/83 Caterpillar movement

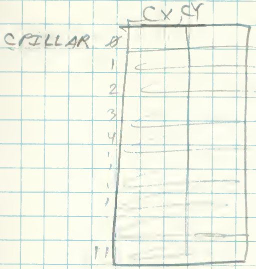


Movement to left.





10/14/83 An algorithm for caterpillar movement



12 entries (X,Y pair)

{get CXNEW, CYNEW}
IF POS(CX,CY) = an entry in CPILLAR then abort
IF CXNEW,CYNEW is adjacent to CPILLAR entry 1
then do change

ELSE
More each entry in same direction as head
until no more detachments. If this
results in the last segment being moved
then abort this "stretch"

~~I tail do:~~
If head & tail not on a surface then
can't move.
Else move tail and tail-1 and tail-2
in head direction. "Hunch" up
tail-3 in a direction normal to movement
(with ↑ preferred over ⇄, downward not possible)
~~Thus~~ "crawl" (CRAWLF) to be done 3 times
if direction of head maintained. Then
next 3 moves will be "unhunching".

10/18/83

Robin Haylett of EXXKO? called 477-2902
about part-time job for McTOY.
will call back

34'11 @ Bundy
R on Olympic
L on Barrington

2001 Barrington #114
L.A.

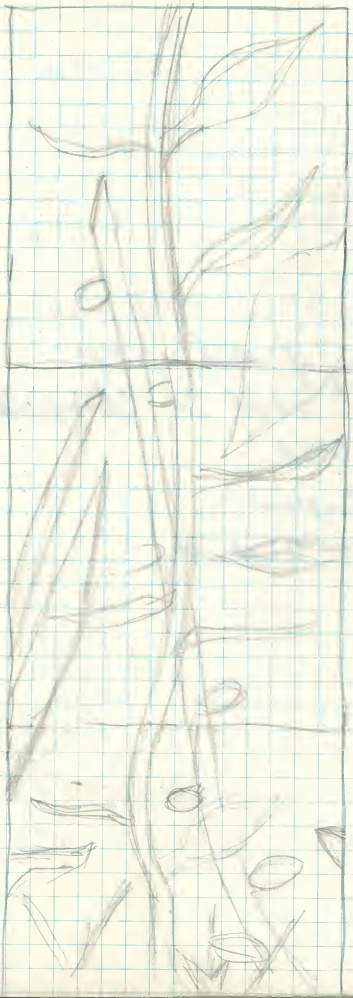
Koala Technologies Inc. (408) 988-8868
Santa Clara

Lisa Broderick for tech. questions

Jim Cox head of software

10/19/83

KOALA PAD
PHYSICAL ACTIVITY AREA



10/20/83 OSS (408) 446-3099

Can declare a 2-byte zero label?
no.

How to run BUG65 without reloading
RUN addr. (must be previously loaded with)
BUG65 addr — see manual)

How to return to BUG65 monitor from user routine?
must use breakpoint at "G addr" @ bkpt.

McToy? Beverly Hills 271-7133

corner of Mich & 21st
10 off on R 26th St Cloverfield
L on Mich.
past Congressman

1745 21st St.
Santa Monica, CA 90404

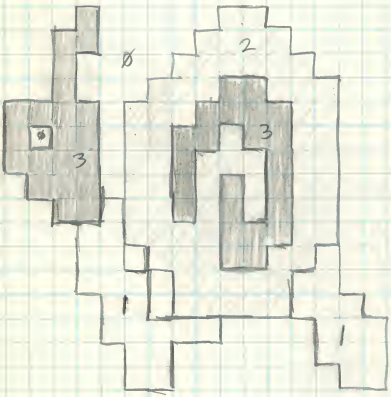
829-3641 Bob McCaskin

(32)

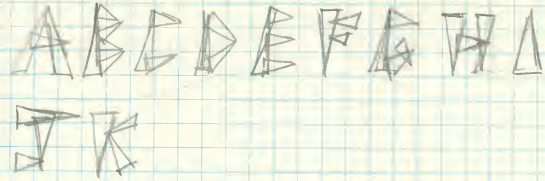
10/26/83


X 1 2 3 4 5 6 7 8 9 10 11
0
4
X 1 2 3 5 6 7 8 9 10 11
1
4 5
X 1 2 3 6 7 8 9 10 11
2
5
6
4
X 1 2 3 7 8 9 10 11
3
4 5
3
6
2
7
X 1
8 9 10 11
5
3 4 5
2
6
X 1
7
8 9 10 11
6
3 4 5
2
6
X 1
7
8 9 10 11
7
3 4 5 6
X 1 2
7
8 9 10 11
8
3 4 5 6
X 1 2
7 8 9 10 11
9
3 4
X 1 2
5 6 7 8 9 10 11
10
3
X 1 2
4 5 6 7 8 9 10 11
11
X 1 2 3 4 5 6 7 8 9 10 11

10/31/83



11/4/23



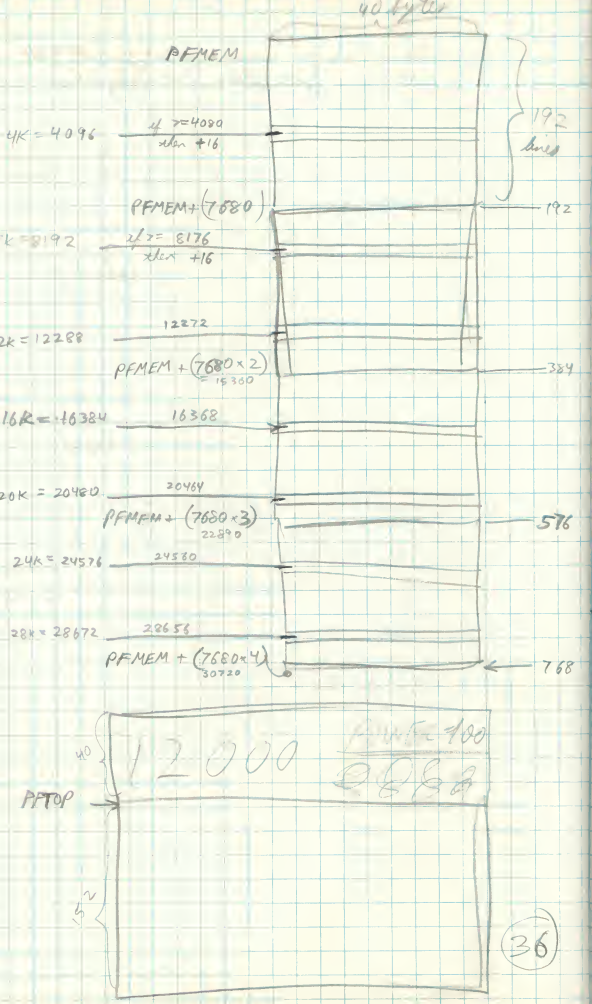
A B C D E F G H I J K

L M N O P Q R S T U

V W X Y Z

11/13/83

$7680_{10} = 1E00_{16}$



Playfield will be indexed by PFTOP (2 LSB) which is the first line of playfield displayed on the screen

To set display list pointer to PF memory, routine CALCPTR is called with VX (range = 0 to 767)
Result returned in V1

```
CALCPTR   ROL   PFTOP       ; calculate PFTOP * 40
          ROL   PFTOP+1
          ROL   PFTOP
          ROL   PFTOP+1
          ROL   PFTOP
          ROL   PFTOP+1
          LDA   PFTOP
          STA   V1
          LDA   PFTOP+1
          STA   V1+1
          ROL   PFTOP
          ROL   PFTOP+1
          ROL   PFTOP
          ROL   PFTOP+1
          CLC
          LDA   V1
          ADC   PFTOP
          STA   V1
          STA   V2
          LDA   V1+1
          ADC   PFTOP+1
          STA   V1+1          ; V1=V2= PFTOP * 40
          STA   V2+1
; for every 4K boundary crossing - add 16 if within 16 of boundary
```

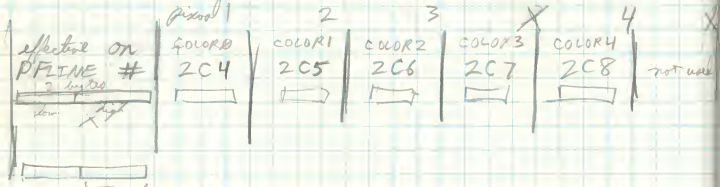
```
; first, take care of boundaries already passed
        LDA!  #$18        ; start with 1st 4K boundary
        STA   V3
?LP1    LDA   V1+1
        AND   #$F0
        CMP   V3
        BMI   BR1         ; If below boundary then exit
        CLC               ; else increase boundary to next 4K
        LDA   V3
        ADC   #$10
        STA   V3
        CLC
        LDA   V1
        ADC   #16         ; and add 16 to V1
        STA   V1
        LDA   V1+1
        ADC   #0
        STA   V1+1
        JMP   ?LP1

; check if within 16 of next boundary
?BR1    CLC
        LDA   V1
        ADC   #16
        STA   V2
        LDA   V1+1
        ADC   #0
        STA   V2+1        V2 = V1+16
        AND   #$F0
        STA   V3
        LDA   V1+1
        AND   #$F0
        CMP   V3          ; compare MSD's of V1 and V2
        BEQ   ?BR2        ; if no change then not within 16 of boundary
        LDA   V2
        STA   V1
        LDA   V2+1
        STA   V1+1
```

; ~~How~~ add in offset and use value to set
; display bit pointer

```
        CLC
?BRZ -- LDA   V1+1
        ADC   #>PFMEM      ; must be 4K boundary
        STA   V1+1
        RTS
```

DLI FILE

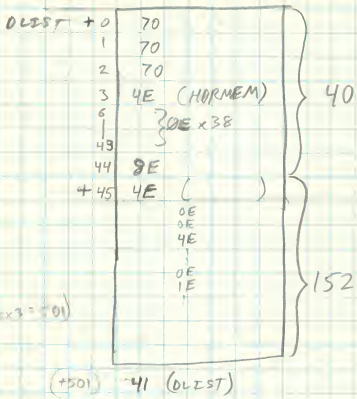
must be increasing order



255 in 2nd byte is end of file (max entries = 32)

```
; Set DLI interrupts in the display list according to
; DLIFILE.  This must be done dynamically since the screen
; scrolls vertically.
SETDLI  LDX #0
?LP1    TXA             LDA  DLIFILE+1,X
        ASL A           CMP  #255          ; 255 marks end of DLIFILE
        ASL A           BEQ
        TAX             STA  V1+1
                        LDA  DLIFILE,X
                        STA  V1            ; V1 = playfield line number of DLI
                        CMPW V1,PFTOP      ; see where DLI is relative to screen
                        BMI                ;  above top of screen
                        BEQ                ;  at top of screen
;
; DLI is below top of screen - see if it's above the bottom
                        CLC
                        LDA  PFTOP
                        ADC  #             ; add height of display window
                        STA  V2
                        LDA  PFTOP+1
                        ADC  #0
                        STA  V2+1
                        CMPW V2,V1
                        BMI                ; below bottom of screen
```

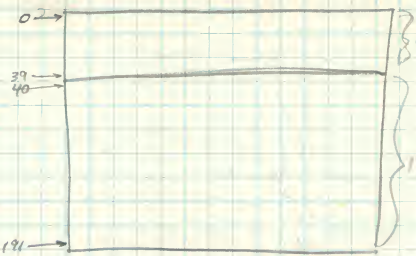
; DLI is within displayed bounds



Interspersed with DLI's and memory scan reg. loads for 4K align

453
478

Display list



; Setup the Display List

```
IDLIST  LDA  #$70
        STA  DLIST
        STA  DLIST+1
        STA  DLIST+2
        LDA  #$4E
        STA  DLIST+3
        LDA  #<HORMEM
        STA  DLIST+4
        LDA  #>HORMEM
        STA  DLIST+5
        LDA  #$0E
        LDX  #38
?LP1    STA  DLIST+6,X
        DEX
        BNE  ?LP1
        LDA  #$8E
        STA  DLIST+45
        LDX  #151
?LP2    LDA  #$4E
        STA  (PTR1),Y
        CLC
        LDA  PTR1
        ADC  #3
        STA  PTR1
        LDA  PTR1+1
        ADC  #0
        STA  PTR1+1
        DEX
        BNE  ?LP2
        LDA  #$41
        STA  DLIST+637
        LDA  #<DLIST
        STA  DLIST+638
        LDA  #>DLIST
        STA  DLIST+639
        RTS
```

; DLIST must be on a 1K boundary

```
        LDA  #<[DLIST+46]
        STA  PTR1
        LDA  #>[DLIST+46]
        STA  PTR1+1
        LDY  #0
```

; 151 bytes of mode E

11/15/83 Hopefully scan lines which must begin on a 4K boundary

0	0
4K	102
8K	204
12K	306
16K	408
20K	510
24K	612
28K	714

align table has make line values which must be on 4K boundaries

ALIGNL 0, <102, <204, <306, <408, <510, <612, <714

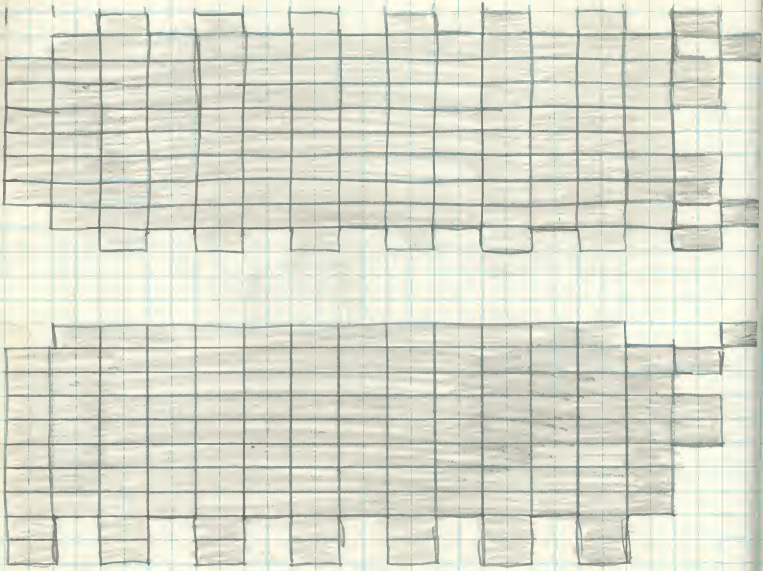
ALIGNH 0, >102, >204, >306, >408, >510, >612, >714

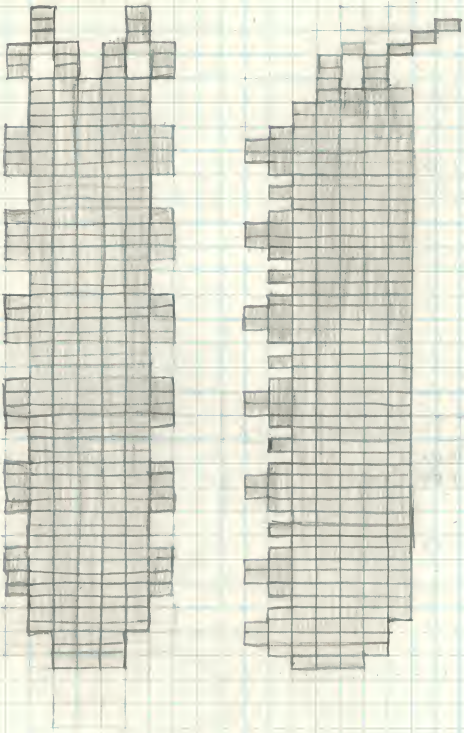
DLI table has make lines which DLI's occur on (max = 8) created from the DLIFILE

DLI TBL

DLI TBH

12/9/83





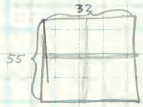
12/15/83

CP Picture file

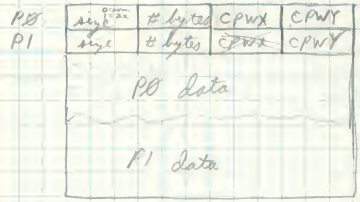
ptr to picture P0
ptr to picture P1

CPX, CPY update

CPWINDW



3K

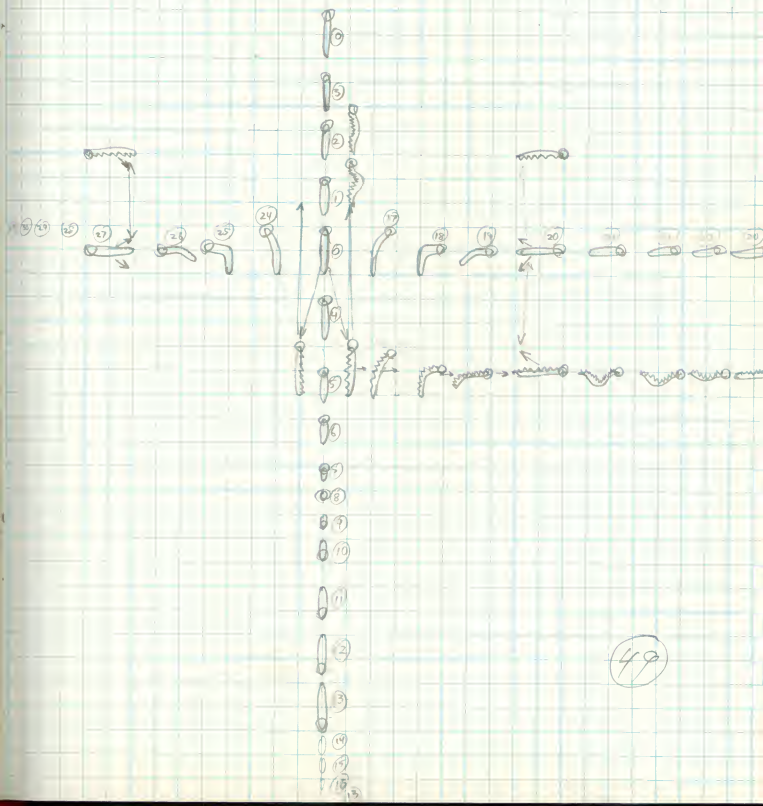


CP picture frame

next state ptrs. (8 bytes) (0 = not used)
CPW INX
CPW INY
window position deltas

reflection byte
0 – no reflection
1 – top to bottom
2 – right to left

12/15/83



BLANK

12/17/83 Crane running

view facing maneuver progress
TV NN RT (0-9)
LS NE LT
FF
BL

view
TV = top view
LS = left side view

facing (at start of maneuver)
NN = north
NE = northeast
XX = etc. (compass directions)

maneuver
RT = right turn
LT = left turn
FF = face forward
BL = back loop
FC = forward crawl

progress
0-9 = how far along with maneuver

TVNNFF0

0, 55, 13, 0
0, 0, 0, 0
; P0
68, 68, 68, 170, 170, 170, 124, 124, 124, 124

254, 254, 254, 254, 124, 124, 124, 254, 254, 254, 254

124, 124, 124, 254, 254, 254, 254, 124, 124, 124

254, 254, 254, 254, 124, 124, 124, 254, 254, 254, 254

124, 124, 124, 254, 254, 254, 254, 124, 124, 124

56, 56, 56
; P1

TVNNRT1

0, 50, 13, 5
0, 17, 21, 0
; P0
1, 1, 3, 3, 7, 7, 15, 15, 31, 31, 63, 63, 127, 255, 255, 254

124, 124, 124, 254, 254, 254, 254, 124, 124, 124

254, 254, 254, 254, 124, 124, 124, 254, 254, 254, 254

124, 124, 124, 254, 254, 254, 254, 124, 124, 124

56, 56, 56

; P1

4, 8, 48, 81, 166, 202, 244, 248, 248, 240, 240

224, 224, 192, 192, 128, 128

TVNNRT2

```
0, 32, 13, 23
1, 10, 21, 22

;P0

1, 7, 15, 31, 63, 127, 127, 127, 255, 254, 254, 254

124, 124, 124, 254, 254, 254, 254, 124, 124, 124

254, 254, 254, 124, 124, 124, 56, 56, 56

;P1

170, 253, 254, 254, 252, 252, 254, 254, 253, 170
```

TVNNRT3

```
1, 12, 0, 22
1, 10, 16, 22

;P0

2, 7, 15, 31, 31, 63, 63, 127, 127, 62, 60, 24

;P1

170, 253, 254, 254, 252, 252, 254, 254, 253, 170
```

TVNNFC 1

0,46,13,0
0,0,0,0
;P0
68,68,68,170,170,170,124,124,124,124,254,254,254,254
124,124,124,254,254,254,254,124,124,254,254
124,124,254,254,124,124,254,254,124,124,124
254,254,254,254,124,124,124,56,56,56
;P1

TVNNFC2

0,53,13,0
0,0,0,0
;P0
68,68,68,170,170,170,124,124,124,124,254,254,254,254
124,124,124,254,254,254,254,124,124,124,254,254,254
124,124,124,254,254,254,124,124,124,254,254,254,254
124,124,124,254,254,254,254,124,124,124,56,56,56
;P1

TVNNFC3

0,53,13,0
0,0,0,0
68,68,68,170,170,170,124,124,124,124,254,254,254,254
124,124,124,254,254,254,254,124,124,124,254,254,254
124,124,124,254,254,254,124,124,124,254,254,254,254
124,124,124,254,254,254,254,124,124,124,56,56,56

TVNNBL1 0,42,13,0
0,0,0,0

;P0

68,68,68,170,170,170,124,124,124,124,254,254,254,124,124

254,254,254,124,124,254,254,124,124,254,254,124,124

254,254,~~124,124,254,254,254~~,124,124,124,~~56,56,56~~
254,254,254,124,124,124,56,56,56
;P1

TVNNBL2 0,39,13,0
0,0,0,0

;P0

68,68,68,170,170,170,124,124,124,124,254,254,124,124

254,254,124,124,254,254,124,124,254,254,124,124

254,254,124,124,254,254,254,124,124,124,56,56,56

;P1

TVNNBL3 0,25,13,0
0,0,0,0

;P0
68,68,68,170,170,170,124,124,124,254,254,124,124

254,254,124,124,254,254,124,124,124,124,56,56

;P1

TVNNBL4

0, 18, 13, 0
0, 0, 0, 0

68, 68, 68, 170, 170, 170, 124, 124, 254, 254, 124, 124

254, 254, 170, 170, 56, 56

TVNNBL5

0, 15, 13, 0
0, 0, 0, 0

68, 68, 68, 170, 170, 170, 124, 124, 124, 254, 254

124, 124, 56, 56

LSNNFF0

0, 54, 0, 0
0, 0, 0, 0

1, 10, 20, 20, 20, 30, 62, 62, 126, 254, 254, 126, 62, 126, 62

126, 254, 254, 126, 62, 126, 62, 126, 254, 254, 126, 62, 126

62, 126, 254, 254, 126, 62, 126, 62, 126, 254, 254, 126

62, 126, 62, 126, 254, 254, 126, 62, 126, 252, 252, 124, 56

LSNNFC1

0, 44, 0, 1
0, 39, 8, 0
; P0
1, 1, 0, 2, 0, 2, 0, 3, 0, 6, 2, 6, 3, 12, 6, 25, 5, 25, 5, 12, 7, 6, 3, 1, 5, 1, 5
3, 1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 3, 3, 1, 3, 3, 7, 31, 31
63, 127, 63, 126, 252, 252, 124, 56
; P1
128, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 128, 128, 192, 224, 240, 248
252, 252, 254, 255, 63, 63, 31, 31, 127, 127, 127, 126, 254, 252
248, 248, 240, 240, 224, 192, 192, 128

LSNNFC2

0, 49, 0, 1
0, 38, 8, 0
; P0
1, 1, 0, 2, 0, 2, 0, 3, 0, 6, 2, 6, 3, 12, 6, 25, 4, 25, 5, 12, 7, 6, 3, 6, 3, 6, 3
7, 7, 7, 3, 3, 7, 7, 3, 1, 3, 3, 1, 7, 7, 7, 15, 15, 15, 31, 63, 31, 63, 63
126, 254, 254, 126, 62, 126, 62, 126, 252, 252, 124, 56
; P1
128, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 128, 128, 192, 192, 224, 224
240, 240, 240, 240, 240, 240, 240, 240, 240, 240, 240, 240
224, 224, 224, 192, 192, 128, 128

LSNNFC3 0,51,0 1
0, 28, 8, 0

;P0

1, 10, 20, 20, 20, 39, 62, 62, 126, 255, 255, 127, 63, 63, 31, 31, 31

15, 15, 31, 31, 15, 15, 31, 31, 15, 31, 63, 63 127, 126, 62, 126

62, 126, 254, 254, 126, 62, 126, 62, 126, 254, 254, 126, 62

126, 252, 252, 124, 56

;P1

11

128, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 128, 128, 128

192

192, 192, 192, 192, 192, 192, 192, 192, 192, 192

128, 128, 128, 128

TVEEFF0 1,10,0,21
1,10,16,21

42,127,255,255,255,255,255,255, 127,42

170, 253, 254, 254, 252, 252, 254, 254, 253, 170

TVEELT1 1,10,0,21
1,23,16,8
;P0
42,127,255,255,255,255,255,255, 127,42
;P1
1,2,4,6,6,12,15,14, 30,30,62,63, 124,248, 240,240

224,224, 192,192,192, 128

TVEELT2 1,11,0,20
0,30,16,0
;P0
1,43,127, 255,255,255,255,255,255, 127,42

;P1

68,68,68, 170,170,170, 124,124,124, 254,254,254,254

124,124,124,254,254,254,254, 252,253,252,254,254

252, 248, 240, 192

TVEELT3 0, 26, 0, 27
0, 45, 8, 0

; P0

7
1, 1, 1, 1, 3, 1, 1, 3, 3, 3, 3, 7, 7, 15, 15, 15, 31, 31

63, 63, 126, 124, 124, 120, 56, 16

; P1

68, 68, 68, 170, 170, 170, 124, 124, 124, 124, 254, 254, 254, 254

124, 124, 124, 254, 254, 254, 254, 124, 124, 124

254, 254, 254, 254, 252, 252, 252, 252, 252

248, 248, 240, 240, 240, 224, 224, 224, 192, 192, 128, 128

TVEEBL1 1, 10, 0, 21
1, 10, 16, 21

; P0

6
42, 127, 255, 255, 255, 255, 255, 255, 127, 42

; P1

168, 244, 248, 248, 240, 240, 248, 248, 244, 168

```
TVEEBL2   1,10,0,21
          1,10,16,21

          ;P0

          42,127,255,255,255,255,255,255,127,42

          ;P1

          160,208,224,224,192,192,224,224,208,160

TVEEBL3   1,10,8,21
          1,10,16,21

          42,127,255,255,255,255,255,255,127,42

          ;P1

          128,64,128,128,0,0,128,128,64,128

TVEEBL4   1,10,0,21
          0,0,0,0

          42,125,254,254,252,252,254,254,125,42

TVEEBL5   1,10,0,21
          0,0,0,0

          40,116,248,248,240,240,248,248,116,40
```

BLANK

JSINDX / STATE	↑	↗	→	↘	↓	↙	←	↖
1	2		16 +2		5		23 -2	
	0		+1 +2		Ø		-1 -2	
	0		0		+3		0	
	TVNNFFØ	Ø						
2	3		16 +2		1		23 -2	
	0		+1		0		-1	
	-5		0		0		0	
	TVNNFC1	Ø						
3	4		16 +2		2		23 -2	
	0		+1		0		-1	
	-2		0		+5		0	
	+VNNFC2	Ø						
4	1		16 +2		3		23 -2	
	0		+1		0		-1	
	-2		0		+2		0	
	TVNNFC3	Ø						
5	1		16 +2		6		23 -2	
	0		+1		0		-1	
	-13		0		+3		0	
	TVNNBL1	Ø						
6	5				7			
	0				0			
	-3				+14			
	TVNNBL2	Ø						
7	6				8			
	0				0			
	-14				+7			
	TVNNBL3	Ø						
8	7				9			
	0				0			
	-7				+3			
	TVNNBL4	Ø						
9	8				10			
	0				0			
	-3				-40			
	TVNNBL5	Ø						

next state
CPW INX
CPW INY

STATE	↑	↗	→	↘	↓	↙	←	↖
10	9				11			
	0				0			
	+40				+3			
	TVNNBL5		1					
11	10				12			
	0				0			
	−3				+7			
	TVNNBL4		1					
12	11				13			
	0				0			
	−7				+14			
	TVNNBL3		1					
13	12				14			
	0				0			
	-14				+3			
	TVNNBL2		1					
14	13		42		15		45	
	0		−2		0		+2	
	−3		0		+13		0	
	TVNNBL1		1					
15	14		42		58		45	
	0		−2		0		+2	
	-13		0		0		0	
	TVNNFFØ		1					
16	1		17	17	17		1	1
	0		0	0	0		0	0
	0		0	0	0		0	0
	R1		0					
17	16	16	18	18	18		16	16
	0	0	±6°	±6°	±6°		0	0
	0	0	0	0	0		0	0
	R2		0					
18	17	17	19	19	19		17	17
	±6°	±6°	0	0	0		±6°	±6°
	0	0	0	0	0		0	0
	R3		0					
19	30		20		33		57	
	0		+6		0		0	
	0		0		0		0	
	R4		0					

	↑	↗	→	↘	↓	↙	←	↖
20	30		21		33		19	
	0		0		0		-6	
	0		0		0		0	
	R5		0					
21	30		22		33		20	
	0		0		0		0	
	0		0		0		0	
	R6		0					
22	30		19		33		21	
	0		0		0		0	
	0		0		0		0	
	R7		0					
23	1	1	1		24	24	24	
	0	0	0		0	0	0	
	0	0	0		0	0	0	
	R1		2					
24	23	23	23		25 +6°	25 +6°	25 +6°	23
	0	0	0		0	0	0	0
	0	0	0		0	0	0	0
	R2		2					
25	24 -6°	24 -6°	24 -6°		26	26	26	24 -6°
	0	0	0		0	0	0	0
	R3		2					
26	36		48		39		27	
	0		0		0		-6	
	0		0		0		0	
	R4		2					
27	36		26		39		28	
	0		+6		0		0	
	-8°		0		0		0	
	R5		2					
28	36		27		39		29	
	0		0		0		0	
	-8°		0		0		0	
	R6		2					
29	36		28		39		26	
	0		0		0		0	
	-8°		0		0		0	
	R7		2					

	↑	↗	→	↘	↓	↙	←	↖
30	31		19	19	19		31	31
	0		0	0	0		0	0
	0		0	0	0		≠11°	≠11°
	U1		0					
31	32	30	30	30	30		32	32
	0	0	0	0	0		0	0
	0	±11°	±11°	±11°	±11°		0	0
	U2		0					
32	1	31	31	31	31		1	1
	+2	0	0	0	0		+2	+2
	0	0	0	0	0		0	0
	U3		0					
33	19	19	19		34	34	34	
	0	0	0		0	0	0	
	0	0	0		0	0	0	
	D1		0					
34	33	33	33	33	35	35	35	
	0	0	0	0	0	0	0	
	0	0	0	0	0	0	0	
	D2		0					
35	34	34	34	34	15	15	15	
	0	0	0	0	8	8	8	
	0	0	0	0	0	0	0	
	U3		1					
36	37	37	37		26	26	26	
	0	0	0		0	0	0	
	0	0	0		0	0	0	
	U1		2					
37	38	38	38		36	36	36	36
	0	0	0		0	0	0	0
	0	0	0		0	0	0	0
	U2		2					
38	1	1	1		37	37	37	37
	0	0	0		0	0	0	0
	0	0	0		0	0	0	0
	U3		2					
39	26		40	40	40		26	26
	0		0	0	0		0	0
	0		0	0	0		0	0
	D1		2					

	↑	↗	→	↘	↓	↙	←	↖
40	39		41	41	41	39	39	39
	0		0	0	0	0	0	0
	0		-0	0	0	0	0	0
	D2		2					
41	40		15	15	15	40	40	40
	0		0	0	0	0	0	0
	+22		0	0	0	0	0	0
	43		3					
42	43	43	43		15	15	15	
	0	0	0		+2	+2	+2	
	0	0	0		0	0	0	
	R1		1					
43	44	44	44	42	42	42	42	
	-6	-6	-6	0	0	0	0	
	0	0	0	0	0	0	0	
	DR2		0					
44	19	19	19	43	43	43	43	
	0	0	0	+6	+6	+6	+6	
	0	0	0	0	0	0	0	
	DR3		0					
45	46		15	15	15		46	46
	+3		-2	-2	-2		+3	+3
	+22		0	0	0		+22	+22
	R1		3					
46	47		45	45	45	45	47	47
	+6		-3	-3	-3	-3	+6	+6
	0		-22	-22	-22	-22	0	0
	DR2		2					
47	26		46	46	46	46	26	26
	0		-6	-6	-6	-6	0	0
	0		0	0	0	0	0	0
	DR2		2					
48	36		49		39		26	
	0		0		0		0	
	-6		0		0		0	
	BS1		2					
49			50				48	
			0				0	
			0				0	
	DS2		2					

	↑	↗	→	↘	↓	↙	←	↖
50			51 +16 0				49 0 0	
	BS3		2					
51			52 0 0				50 -16 0	
	BS4		2					
52			53 +8 0				51 0 0	
	BS5		2					
53			54 0 0				52 -8 0	
	BS5		0					
54			55 0 0				53 0 0	
	BS4		0					
55			56 0 0				54 0 0	
	BS3		0					
56			57 0 0				55 0 0	
	BS2		0					
57	30 0 +6		20 0 0		33 0 -2		56 0 0	
	BS1		0					
58	15 0 0		42 -2 0		59 0 +5		45 +2 0	
	TVNNFC1		1					
59	58 0 -5		42 -2 0		60 0 +2		45 +2 0	
	TVNNFC2		1					

	0 -2		-2 0		0 +2		+2 0	
	TVNNFC3		1					
61								
62								
63								
64								
65								
66								
67								
68								
69								

BLANK

(50)

BLANK

(71)

BLANK

10/7/83

Sector dump from disk created by
MICRO ILLUSTRATOR

sector 1

byte # — unused — # sectors to load — load addr. — start — transfer control after boot on SYSTEM RESET

0 ⟶ 00 03 00 07 40 15

```
4C  14 07        JMP $0714

byte #9   A   B   C   D   E   F
07   03   00   7C   1A   00   04

10           ↓#$14
00   7D   CB   07   AC   0E   07   F0

36   AD   12   07   85   43   8D   C4
```

714
36
74F

```
714  AC  0E 07   LDY  #$070E     ; = 0
717  F0  36      BEQ  $74F?
     AD  12 07   LDA  $0712      ; = $CB
     85  43      STA  $0043
     8D  04 03   STA  $0304
     AD  13 07   LDA  $0713      ; = $07
     85  44      STA  $0044      ; vector at 0043 now set to address $07CB
     8D  05 03   STA  $0305
     AD  10 07   LDA  $0710      ; = 0
     AC  0F 07   LDY  #$070F
```

(23)

BLANK

74

add

$074F	A9 C0	LDA	#$C0
$0751	D0 01	BNE	$754
$0753	68	PLA	
754	0A	ASL	A
	A8	TAY	
	60	RTS	

First sector in file (only 1 sector long!) (file was horizontal line at top of screen in Default Blue (grid value 37))

byte#								
00	FF	80	C9	C7	1A	00	01	02
						color 0	color 1	color 2
08	0E	00	28	00	C0	28	CA	94
	color 3	color 4						
10	0C	00	20	00	00	00	9B	9B
				# bytes to fill?	first byte value	# bytes to fill of zeros		
18	9B	9B	A2	28	FF	00	1D	D8
20	00	5A	00	05	03	04	00	0E
28	55	12	00	19	05	06	06	81
30	05	04	06	85	05	07	00	83
38	03	00	35	05	05	03	DD	82
40	FF	53	02	73	02	F0	81	30
48	02	00	00	55	12	00	1A	05
50	03	06	08	00	83	0F	35	F5
58	05	D5	03	DD	03	73	81	70
60	02	F0	03	00	81	50	03	55
68	04	05	81	15	03	55	82	54
70	50	12	00	19	5A	06	AA	81
78	55	04	AA	81	55	04	00	21

NON RELEVANT DATA

00000100 — file #

next sector

sector byte count

76

Blue Dot

Byte #

00	FF	80	C9	C7	1A	00	01	01
	0E	00	28	00	C0	28	CA	94
	0C	00	20	00	0D	00	9B	9B
	9B	9B	A2	81	C0	00	1D	FF

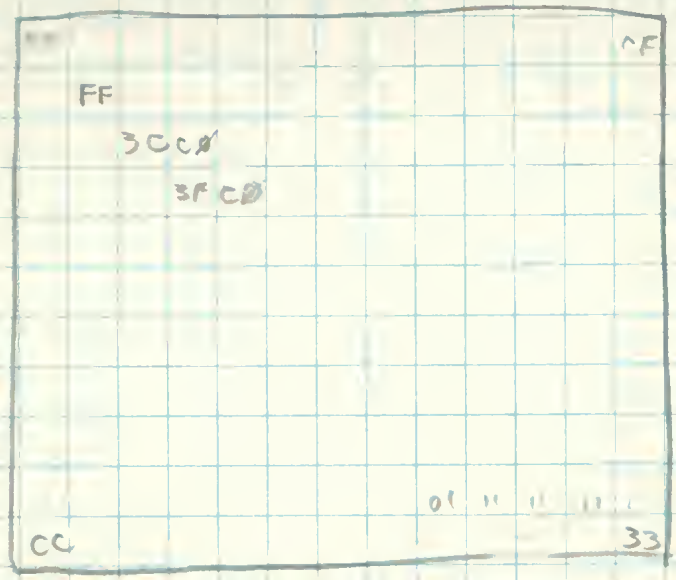
model?

1DD8
28
1E00

1
26
3
28
2
27
2
1D5B
1
26
1
1E00

77

Checkerboard on screen was:



file was:

byte #

00	FF	80	C9	C7	1A	00	01	02
	0E	00	28	00	C0	28	CA	94
	0C	00	36	00	00	08	93	93
	98	9B	A2	81	FF	26	00	83
	CF	00	FF	28	00	82	3C	C0
	27	00	82	3F	C0	00	10_{MSB}	5B LSB
	00	81	CC	26	00	01	33	02
	FF	00	00	BE	00	02	FF	00

(78)

byte #

40

00 BE 00 02 FF 00 00 BE

00 02 FF 00 00 BE 00 02

FF 00 00 BE 00 02 FF 00

00 BE 00 02 FF 00 00 BE

00 02 FF 00 00 BE 00 02

FF 00 00 BE 00 02 FF 00

00 BE 00 02 FF 00 00 BE

00 02 FF 00 00 28 00 37

mode 2

byte values are preceded by 'multiplier' which indicates repetition of following byte. If multiplier msb is a '1' then the remaining multiplier bits indicate how many of the following bytes are to be used directly to the screen.

Scan lines are 40 bytes long

If multiplier is a zero then the next two bytes are to be used as the multiplier count as MSB, LSB

BOX FILE

1 of 4 sectors

byte #

00	FF	80	C9	C7	1A	00	01	01	
	0E	00	28	00	C0	28	CA	94	
	0C	00	10	01	00	00	9B	9B	
	9B	9B	A2	81	F0	0B	F0	54	
	C0	0C	F0	53	C0	02	FF	00	
	00	BE	00	02	FF	00	00	BE	
	00	02	FF	00	00	BE	00	02	
	FF	00	00	BE	00	02	FF	00	
	00	BE	00	02	FF	00	00	BE	
	00	02	FF	00	00	BE	00	02	
	FF	00	00	BE	00	02	FF	00	
	00	BE	00	02	FF	00	00	BE	
	00	02	FF	00	00	BE	00	02	
	FF	00	00	BE	00	02	FF	00	
	00	BE	00	02	FF	00	00	BE	
	00	02	FF	00	00	00	05	7D	

Mode 1 — Mode 1 is an interleaved vertical scan.

80

10/8/83 Discovering Music title page color valu[es]

are:

	COLOR4	COLOR0	COLOR1	COLOR2
	pen val Ø	1	2	3
BIRD	8,5 /	1,14 /	15,3 /	13,7
KEYS	8,5 /	5,8 /	0,15 /	0,0
HIPPO	8,5 /	0,9 /	0,15 /	0,0

colors [illegible]

10/16/83 Screen Pictures

1st - taken at night 1 sec F8
Don't use - DLI off

2 - Diffuse Daylight for all of following
1s F8

3	1s	F16
4	1s	F4
5	1/2 s	F8
6	1/2 s	F4
7	1s	F1.7
8		2,8
9		5,6
10		11
11		16
12	1s	2,8
13		4
14		5,6
		8
		11
	1/2	2,8
		4
		5,6
		8
		11

Leafer Madness

(81)

R4

1,10,0,22
1,10,16,22
;P0
127,255,255,255,255,255,255,255,170,170

;P1
249,254,252,254,254,252,252,252,168,168

R5

1,15,0,16
1,11,16,19

2,7,15,15,31,127,255,255,255,251,249,232,160,160

;P1
128,128,200,240,224,240,240,224,224,224,64,64

R6

1,12,0,19
1,12,16,19

3,7,127,255,255,255,255,255,252,248,168,160
(5)

;P1
128,192,228,248,240,248,248,240,240,112,32,32

R7

1,11,0,20
1,12,16,19

3,127,255,255,255,255,255,255,254,170,168
(6)

;P1
224,240,242,252,248,252,252,240,240,176,16,16

BS1 1,10,0,22
1,10,16,22

127, 255,255,255,255,255,255,255, 170,170

;P1
244,248,240,248,248,240,240,240, 160,160

BS2 1,10,0,22
1,10,16,22

127, 255,255,255,255,255,255,255, 170,170

;P1
144,224,192,224,224,192,192,192,128,128

BS3 1,10,0,22
1,5,16,22

126,255,255,255,255,255,255,255, 170,170

;P1
64,128,0,128,128

BS4 1,10,0,22
0,0,0,0

121,254,253,254,252,252,252,168,168

BS5 1,10,0,22
0,0,0,0
100,248,240,248,248,240,240,240,160,160

R1 0, 50, 11, 5
0, 17, 19, 0

1, 1, 3, 3, 7, 7, 15, 15, 31, 31, 63, 63, 127, 255, 255, 254, 124, 124, 124

254, 254, 254, 254, 124, 124, 124, 254, 254, 254, 254, 124, 124, 124

254, 254, 254, 254, 124, 124, 124, 254, 254, 254, 254

124, 124, 124, 56, 56, 56

;P1
4, 8, 48, 81, 182, 250, 244, 248, 248, 240, 240, 224, 224

192, 192, 128, 128

R2 0, 31, 8, 23
1, 10, 16, 22

1, 7, 15, 31, 63, 127, 127, 127, 255, 254, 254, 254, 124, 124, 124

254, 254, 254, 254, 124, 124, 124, 254, 254, 254, 254

124, 124, 124, 56, 56, 56

;P1
249, 254, 252, 254, 254, 252, 252, 252, 168, 168

R3 1, 12, 0, 22
1, 10, 16, 22

(84)

3, 7, 15, 31, 31, 63, 63, 127, 126, 62, 60, 24

;P1
249, 254, 252, 254, 254, 252, 252, 252, 168, 168

DR2 0, 30, 8, 6
1, 10, 16, 22

56, 56, 56, 124, 124, 124, 254, 254, 254, 254, 124, 124, 124

254, 254, 254, 254, 124, 124, 124, 254, ~~254, 254~~

127, 127, 63, 63, 31, 15, 7, 3

;P1
249, 254, 252, 254, 254, 252, 252, 252, 168, 168

DR3 1, 17, 0, 15
1, 10, 16, 22

32, 112, 112, 120, 124, 124, 126, 127, 63, 63, 31, 15, 15, 7, 3, 2, 2

;P1
249, 254, 252, 254, 254, 252, 252, 252, 168, 168

UI 1, 10, 0, 22
1, 18, 16, 14

127, 255, 255, 255, 255, 255, 255, 255, 170, 170

;P1
1, 14, 28, 31, 63, 62, 126, 126, 254, 252, 252, 252, 248, 240

224, 192, 128, 128

U2

1, 11, 0, 21
0, 29, 16, 1

1, 127, 255, 253, 255, 255, 255, 255, 253, 170, 170

; P1
68, 68, 68, 170, 170, 170, 124, 124, 124, 124, 254, 254, 254, 254

124, 124, 124, 254, 254, 254, 252, 252, 252, 252

248, 240, 224, 192, 128

U3

0, 20, 8, 32
0, 46, 16, 0

1, 1, 1, 1, 3, 3, 3, 7, 7, 15, 15, 31, 31, 31, 63, 62, 126, 124, 60, 24

; P1
68, 68, 68, 170, 170, 170, 124, 124, 124, 124, 254, 254, 254, 254

124, 124, 124, 254, 254, 254, 254, 124, 124, 124, 254, 254, 254, 254

124, 124, 252, 252, 252, 248, 248, 248, 240, 240, 240, 224, 224

192, 192, 128, 128

86

BLANK

87

2/25/84

LEAFER MADNESS

PROGRAMMED BY: Charlie Kulas

CONCEIVED BY: Tony Vece

PRESS JOYSTICK BUTTON TO BEGIN

	char	x, y
L	44	8, 3
E	37	12, 3
A	33	16, 3
F	38	20, 3
E	37	24, 3
R	50	28, 3
M	45	6, 9
A	33	10, 9
D	36	14, 9
N	46	18, 9
E	37	22, 9
S	51	26, 9
S	51	30, 9
P	48	6, 15
R	50	7, 15
O	47	8, 15
G	39	9, 15
R	50	10, 15
A	33	11, 15
M	45	12, 15
M	45	13, 15
E	37	14, 15
D	36	15, 15
B	34	17, 15
Y	57	18, 15
:	26	19, 15

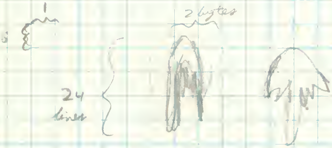
	char	x, y
C	35	21, 15
h	104	22, 15
a	97	23, 15
r	114	24, 15
l	108	25, 15
i	105	26, 15
e	101	27, 15
K	43	29, 15
u	117	30, 15
l	108	31, 15
a	97	32, 15
s	115	33, 15
C	35	7, 17
O	47	8, 17
N	46	9, 17
C	35	10, 17
E	37	11, 17
I	41	12, 17
V	54	13, 17
E	37	14, 17
D	36	15, 17
B	34	17, 17
Y	57	18, 17
;	26	19, 17

	char	x, y
T	52	21, 17
o	111	22, 17
n	110	23, 17
y	121	24, 17
V	54	26, 17
e	101	27, 17
c	99	28, 17
e	101	29, 17
P	48	5, 20
R	50	6, 20
E	37	7, 20
S	51	8, 20
S	51	9, 20
J	42	11, 20
O	47	12, 20
Y	57	13, 20
S	51	14, 20
T	52	15, 20
I	41	16, 20
C	35	17, 20
K	43	18, 20
B	34	20, 20
U	53	21, 20
T	52	22, 20
T	52	23, 20
O	47	24, 20
N	46	25, 20

T
O
B
E
G
I
N
C
O
P
Y
R
I
G
H
T
1
9
8
4
T
/
F
S
T
W
A
R
E

3/3/84

Poison spills:



2, 3 4, 5

SPLTBL <status>, , <spread count>, <ptr to pattern>, <ptr to ta[illegible] ptr to lo[illegible]

SPLPAT width, length, data,

SPLDLY nul, nul , count, - -

(90)

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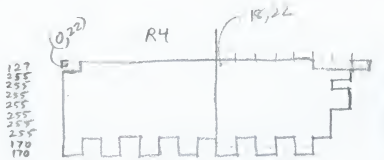
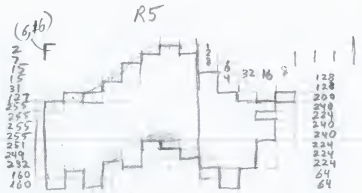
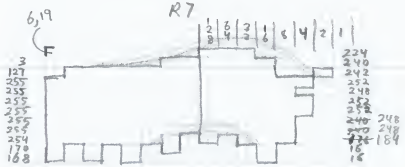

R4
(0,32)
18,22


R5
(6,16)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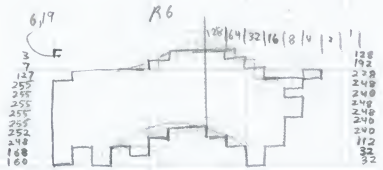
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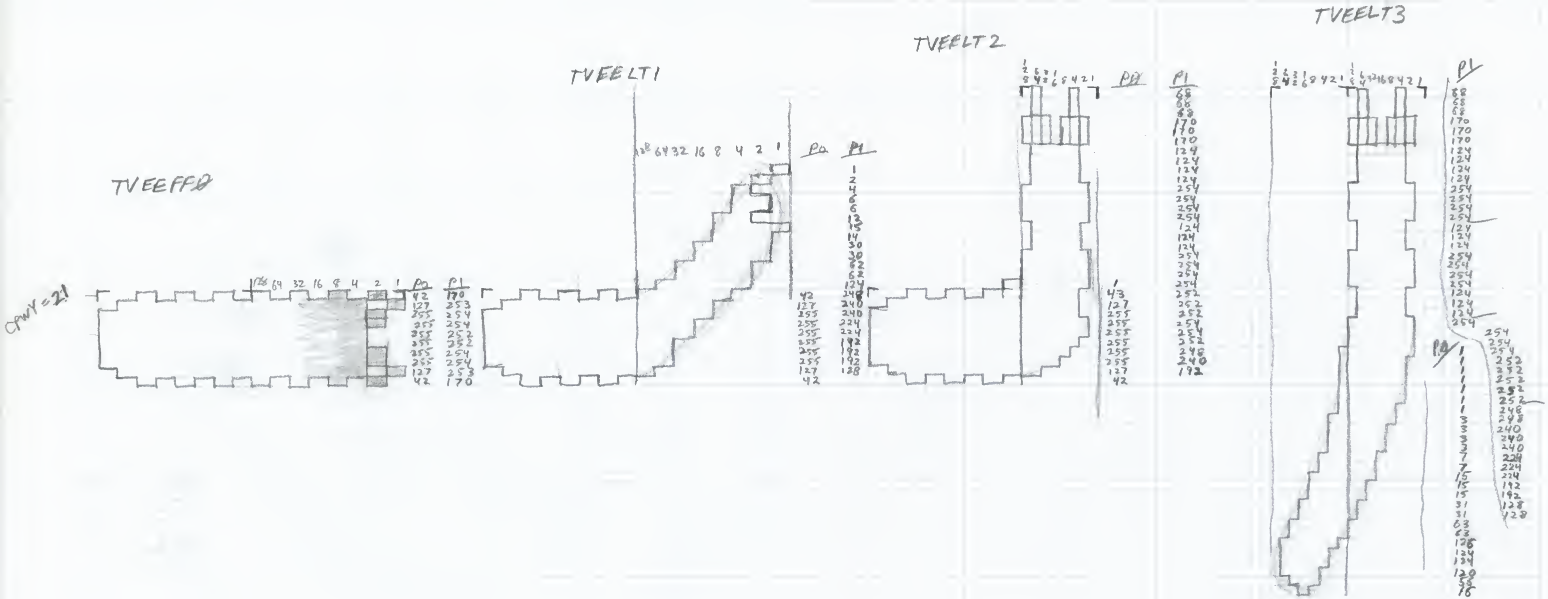

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TVEELT2
TVEELT1
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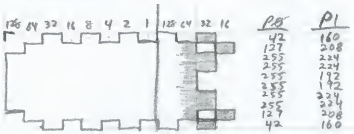
P0
P1

TVEEBL2



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255	224
127	208
42	160

P0	P1
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255	128
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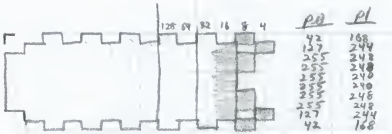
42	128

TVEEBL1



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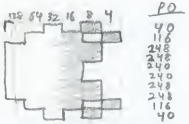
42	168

TVEEBL4



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116
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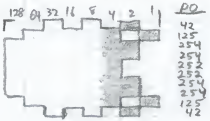
TVEEBL4



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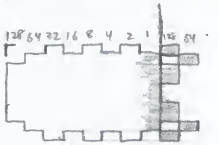
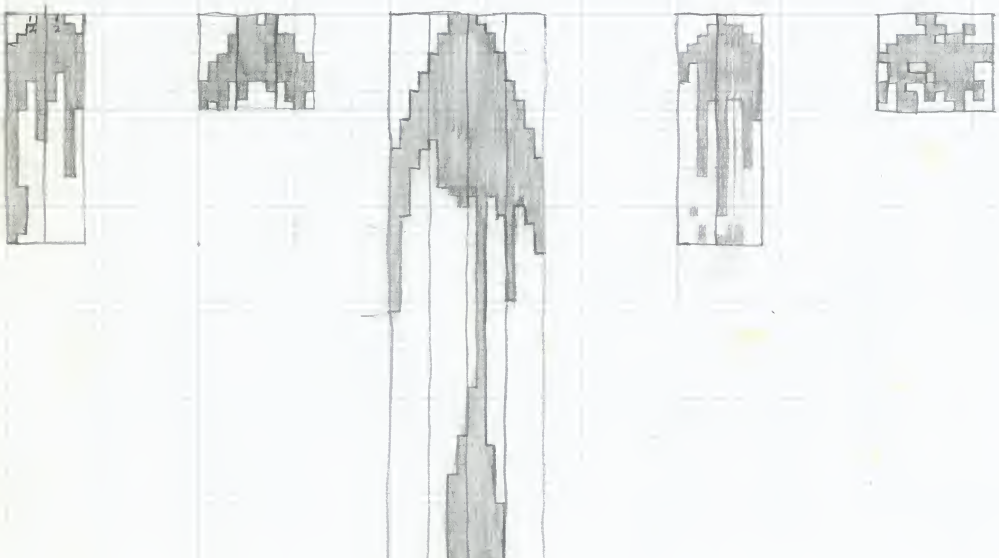
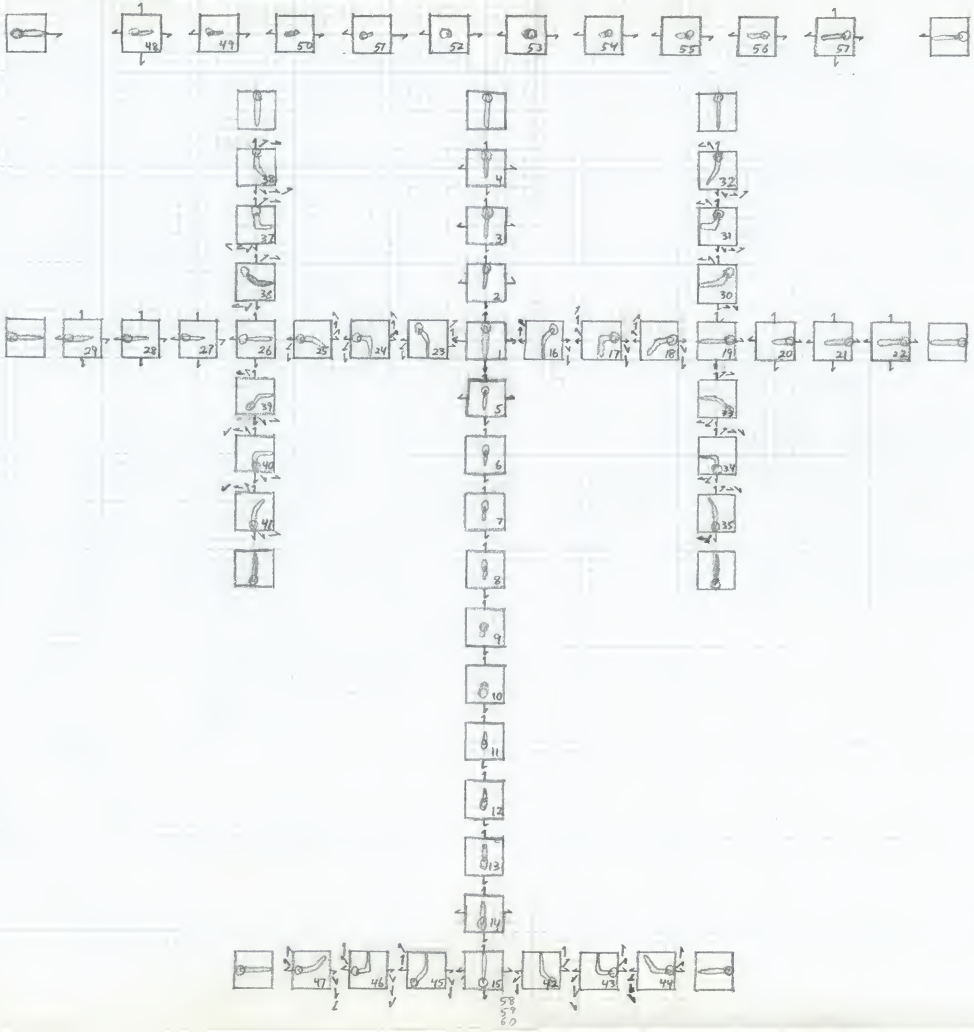
42

TVEEBL3



SPLAT

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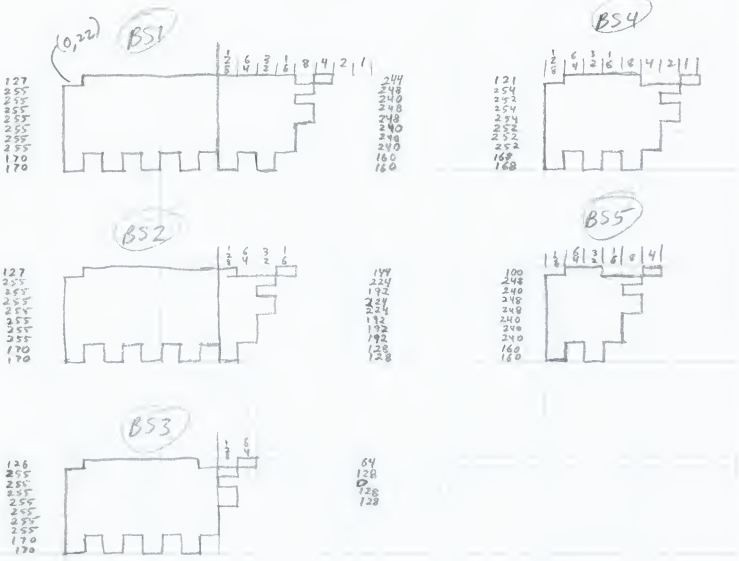
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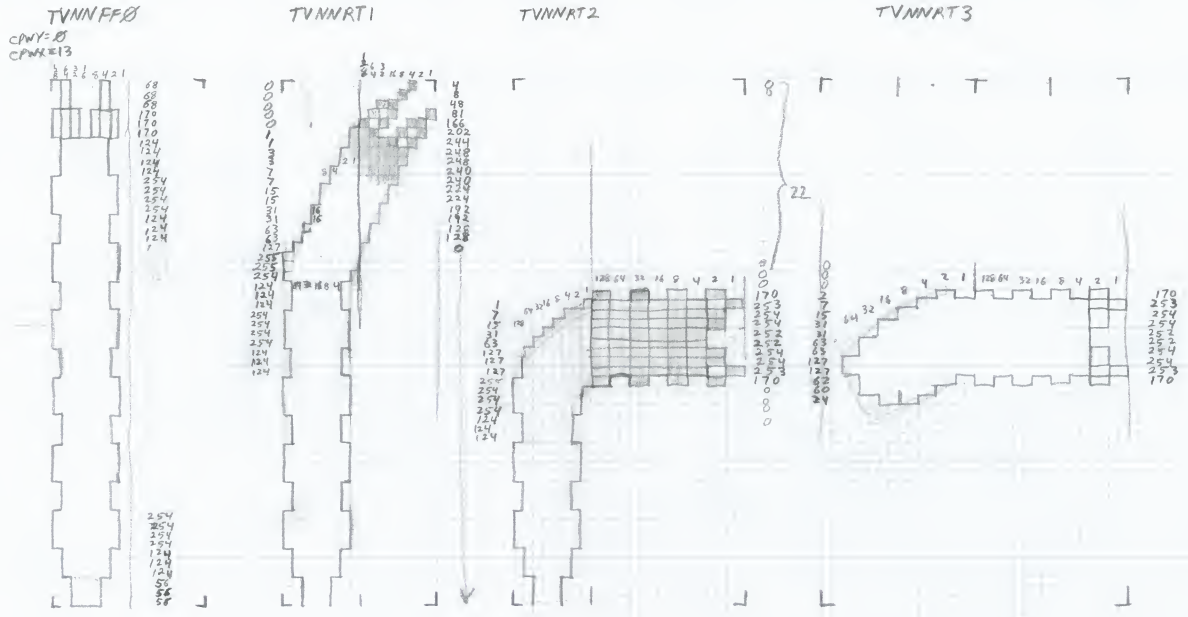
BS1
BS2
BS3
BS4
BS5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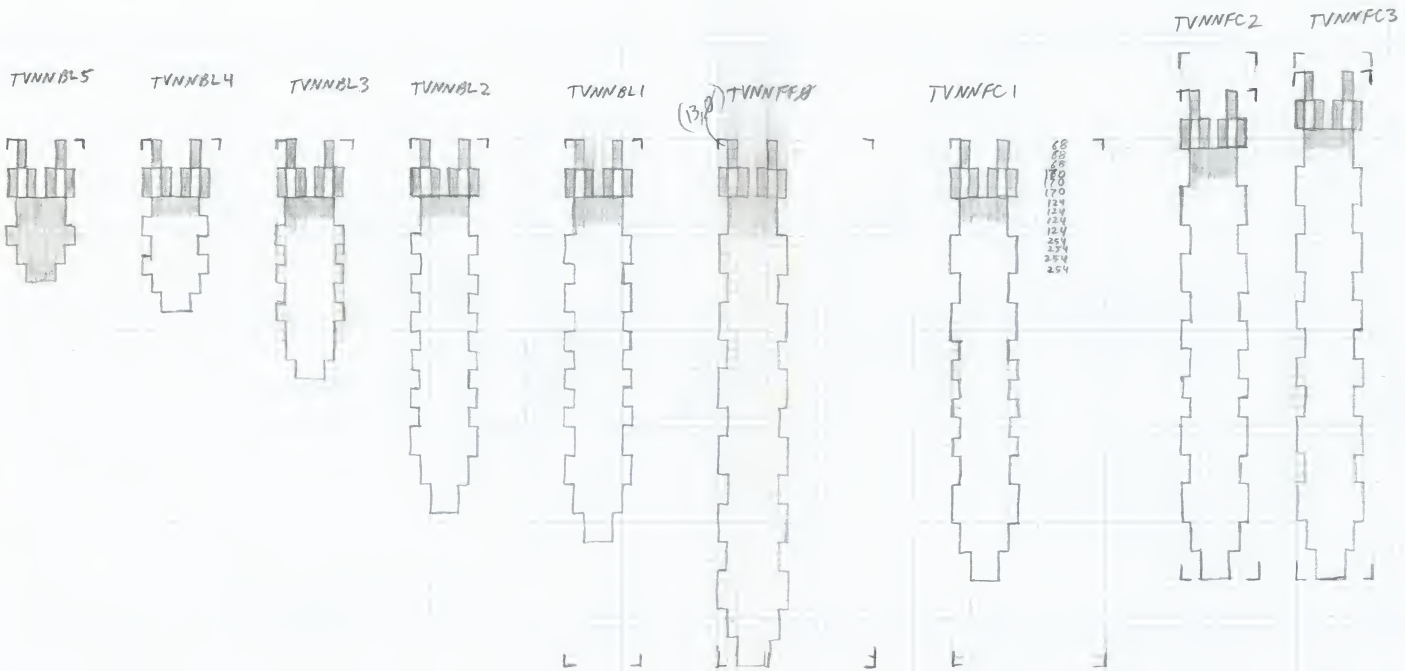
CPWX=13
TVNNRT1
TVNNRT2
TVNNRT3
22


TVNNBL5
TVNNBL4
TVNNBL3
TVNNBL2
TVNNBL1
(13Ø)
TVNNFFØ
TVNNFC1
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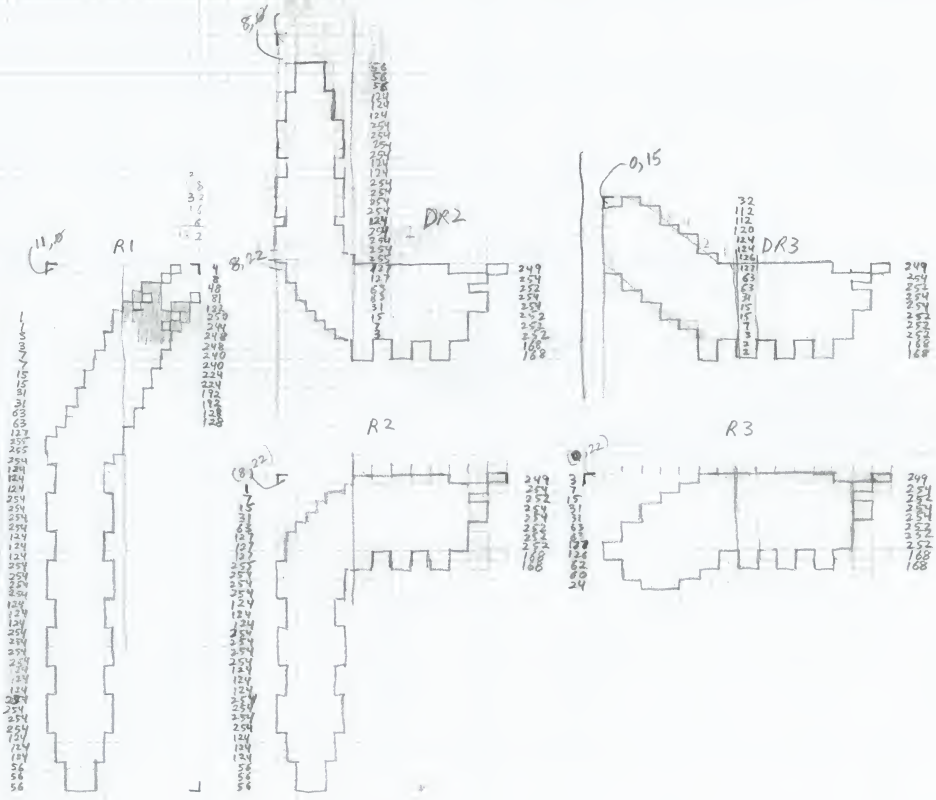
TVNNFC2
TVNNFC3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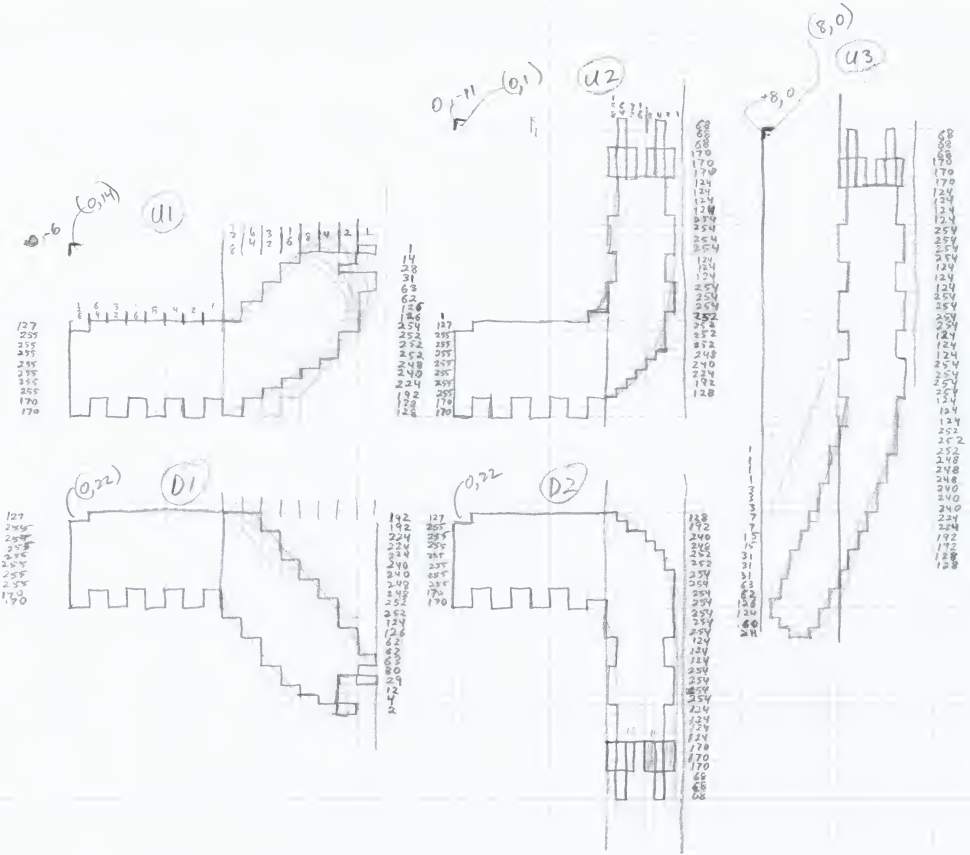
DR2
11,0
R1
8,22
0,15
DR3
R2
R3
22


U1
U2
U3
D1
D2
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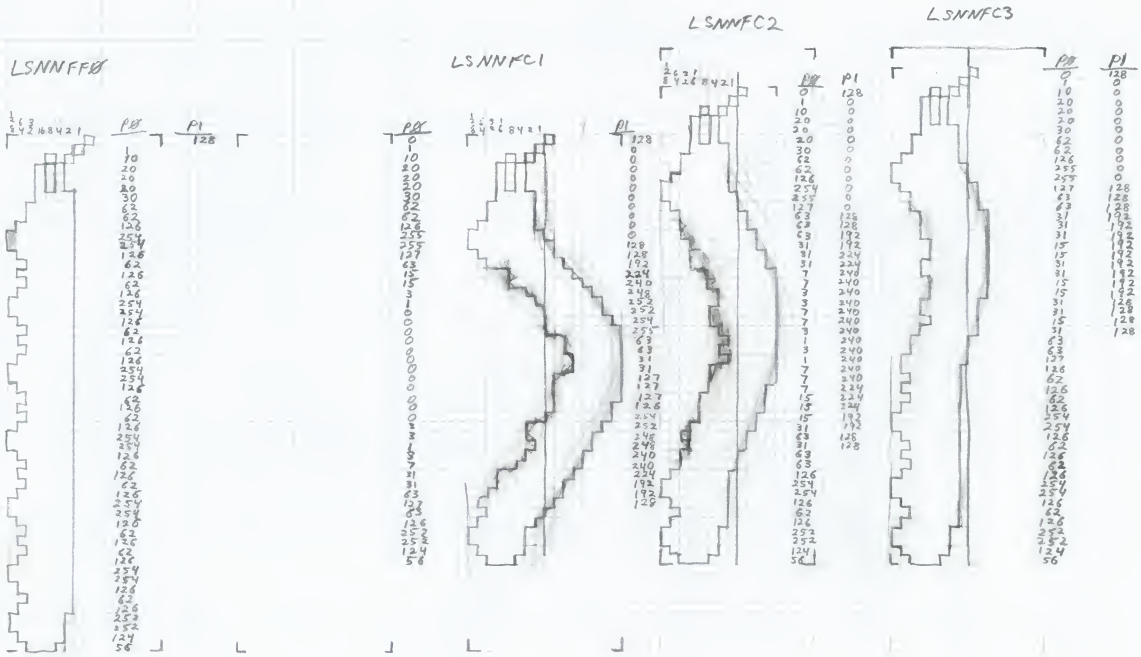
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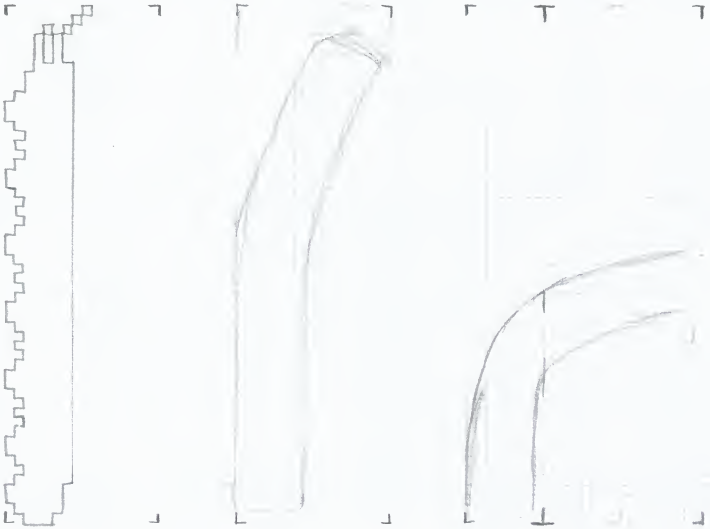
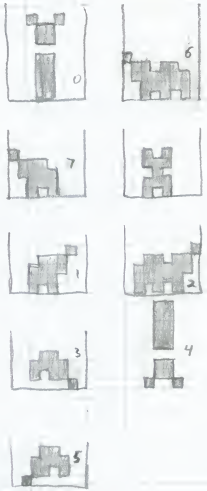
LSNNFC1
LSNNFC2
LSNNFC3
PI
128





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